Contract Farming's credit schemes as an alternative credit source for the smallholders

A case study from Mozambique.

Binit Bhupendra Varajidás

Submitted as partial fulfilment of the degree
Master of Philosophy

June, 2005

Economics Institute
University of Oslo

Binit Bhupendra Varajidás

Contract Farming's credit schemes as an alternative credit source for the smallholders: A case study from Mozambique.

In accordance to the University of Oslo's regulation, at the end of the Environment and Developmental Economics Program a dissertation is required to be written. Hence the following dissertation, as part of the requirement to acquire the Master of Philosophy degree, was presented and approved by the Thesis committee and by the Jury members of the referred University.

Oslo, June 2005.

Jury Members

Halvor Mehlum
(Supervisor)

Jo Thori Lind
(Internal jury)

Qaisar Farooq Akram
(External jury)

To my parents, Bhupendra Varazidás e Pravina Champaklal,

and sisters, Amrita and Yagna Varazidás.

Acknowledgements

First of all highlight that my family and friends played a very significant role through these two years of *effort*. I am indebted to my parents and sisters for their unconditional support and endurance, which kept me going through the sunny and grey days. My friends, Cesar Mussagy, Farhana Suleman, Rui Benfica and Emilio Mosse lighted me all the way and helped me winning over the most stressful moments. To them, the best I can say is: *Couldn't ask for better friends*.

Very special thanks go to Andrea Shindiapin and Knuts Sydsæter without whom wouldn't be possible to be under the *effort* through which was possible to produce the document you are reading. I am indebted to their prompt disposition to help in overcoming any hurdles since I met them, not disregarding the ones faced during this *effort* period.

I wonder what would be the outcome if did not had as supervisors Arild Angelsen and Halvor Mehlum. I am very grateful to their guidance, critics, support, encouragement and challenges. Their contribution, from the topic definition till the document presentation, was what can be called in economics terms *elastic for the contribution demand factor*.

Hearted thanks go to the facilitators of the field research, namely Rui Benfica, the DIMMON and Mozambique Leaf Tobacco companies and their members, Ercilio Infante, and many others (not mentioned here) who directly or indirectly contributed to the achievement you are reading.

Impossible is to forget is the support given by Eivind Bernhardsen, Olav Bjerkhot, Michele Nysæter, Lynn Joy Josephson and my fellow classmates, above all Richard Owusu-Boakye, from the beginning of the stay in Oslo till the compliment of the programme requirements. Additionally I would thank the moral support of the few good friends made in Oslo. A thankful hug goes to the fellow Mozambican students who accompanied throughout the programme.

Finally, but not least important, special thanks to the staff members, teachers, administrative and research fellows of the University of Oslo, specially of the Economics Department. Not forgetting the Norwegian governments' financial support, through the Quota Programme scholarship.

Binit Bhupendra Varajidás

Summary

Most of the rural population in Mozambique operates totally outside the reach of any financial sector operator. Nearly all of the rural districts have no formal banking facilities at all. The microfinance sector is small and has an urban and peri-urban orientation, while both the community-based financial arrangements and development credit institutions have a very limited outreach in rural areas. This institutional situation makes it very difficult for the financial sector to respond to the increasing demands for rural financial services in the country and today practically all seasonal agricultural credit to smallholders is provided by marketing and processing companies under interlocking arrangements.

These interlocking arrangements vary from the contract farming to the farmers' cooperatives. This study focuses on the contract farming type of coordination. It refers to a situation where the contractor agrees on providing inputs and extension services, and expects that the farmer in return provide the input for the agro-processing industry. The contractor can be from the small commercial entity to the enormous agro-processing industry. This arrangement has the potential, according to the literature reviewed, to alleviate the problems arising in the contractual arrangements, like moral hazard and asymmetric information that generates market failures. It also is considered as potential credit channel to the smallholders in rural areas, once they are targeted by the credit market failure.

The operations and traditional production technology of the typical family farm, and its associated credit needs, are too small to warrant the economic extension of the formal credit system. In the short term it can not be expected that the commercial banks would reconsider their strategies of market expansion into agricultural commerce. This study aims to assess to what extent contract farming can be considered as one attenuating instrument of the hindered rural financial sector. The study draws upon the contract farming scheme practiced by the MLT – Mozambique Leaf Tobacco Ltd and DIMMON – Tabacos de Moçambique, in the Tete province. The data was collected using standard and simple, but credible, methodology. The data was obtained through the Ministry of Agriculture, Centro de Promoção de Investimentos (CPI) and some private institutions and individuals. For the confirmation and additional information on the CF scheme, the company's management were contacted.

In terms of the data analysis three main approaches were taken to *gradually increase confirmation* of the proposed hypothesis. One was a triangulation of positivism, post positivism and logical empiricism in order to consider both quantitative and qualitative information. Secondly, Econometrics approach was used. It helped to inspect the sample, through sample

mean tests, student *t*-test and one-way analysis of variance. In addition to this, regression analysis were also used, namely Linear and Logistic (Logit), in order to assess the hypotheses derived for the topic of the study. And finally the case study method which allowed the analysis of a specific case from Mozambique, already mentioned above, being the case of the Tete province's tobacco agro-industrial companies.

The results it's of the regressions ran, suggest that the location (district), the land proportion reserved for each type of crop, the hand tools endowment, level of credit in terms of value are important determinants for the success of the CF's credit scheme as alternative source of credit for the tobacco growers of Tete province. The regressions showed also that there is a relation between the income per member of the household and their characteristic, but it is not as strong to support the idea that their characteristics explain why they are better off under the CF scheme. But it also does not reject the idea that growers characteristics, like the household size, their core activities, whether is farming or/and outside farming, do show some important effects on their well being.

As to conclusions, the agro-industrial CF scheme was shown to be a good alternative to alleviate the credit constraint problem. The results also suggest that CF can be used as a way to link small-scale farmers with agribusiness, on condition that the correct governance structures, good relation between the parties and reduction of transaction cost are taken into account. But at the same time it is also clear that company credit is not, and does not aim to be, a substitute for the operations of the financial institutions. The range of financial services provided by the marketing companies is very narrow, consisting in most cases only of small in-kind seasonal loans.

From different alternatives of coordination options that came up, it was clear that not a unique one of them could be considered as the most appropriate one in order to attenuate the problem analysed. The problem of the agriculture development goes beyond the credit issue to inputs and technology availability, access to markets, transportation and stocking facilities are few among the many existents. Thus there should by an integrated analysis of these issues in order to compute a strategic plan comprising both sectors, financial and agricultural, for the development of the agricultural sector.

Contents

Illustrations

Tables

Figures

Graphs

Acronyms and Abbreviations

ACP – Austral Consultancy and Projects Ltd

AJAL – Associação dos jovens agricultores de Leiria

AMODER – Associação moçambicana para o desenvolvimento rural

AusAid – Australian Agency for International Development

BA – Banco Austral

BCIF – Banco Comercial e de Investimento e de Fomento (BCIF)

BIM – Banco Internacional de Moçambique

BMI – Banco Mercantil de Investimento

BNU – Banco Nacional Ultramarino (colonial period's central bank)

BoM – Bank de Moçambique

BPD – Banco Popular de Desenvolvimento

BSTM – Banco Standard Totta de Moçambique

CARE – Cooperative for American Remittances to Europe

CCCP – Cooperativa e caixa de credito e poupança

CCMI – Coordination committee of inter-bank market

CEA – African studies bureau

CF – Contract Farming Scheme

CPC – Cooperativa de Poupança e Credito

CPI – Centro de Promoção de Investimento

CPMC – Counselor for monetary and exchange policy

CREDICOOP – Cooperativa de Credito e Investimentos

DANIDA – Danish International Development Agency

DAP – Department of Policy Analysis

DDI – Domestic direct investment

DE – Economics Directorate

DNCI – Direcção Nacional de Comercio Interno

ESRP or E(S)RP – Economic and Social Rehabilitation Program

EU – European Union

FAO – Food and Agriculture Organization

FARE – Fund for economic rehabilitation aid

FC – Farmer Cooperatives or Associations

FDHA – Fund for hydraulic agriculture development

FDI – Foreign direct investment

FFA – Fund for agriculture foment

FFP – Fund for fishery foment

FFPI – Fund for small industry foment

G20 – Observatório da Pobreza (grupo dos 20)

GDP – Gross Domestic Product

GNI – Gross national Income

GNP – Gross National Product

GoM – Government of Mozambique

GPSCA – Gabinete de promoção do sector comercial agrícola

HDR – Human Development Report

ICB – Banco Internacional de Comercio (ICB)

ICC – International Chamber of Commerce

IMF – International Monetary Fund

INE – National Statistics Institute

Logit – Logistic

MA – Ministry of Agriculture

MF – Ministry of Finance

MLT – Mozambique Leaf Tobacco

MZM – Mozambican Meticais

NDI – National direct Investment

NGOs – Non-governmental organizations

PA – Principal-Agent theory

PARPA – Action plan for absolute poverty reduction

PNUD – United Nations Development Program (UNDP)

PPI – Indicative Prospective Plan

PROAGRI – National program of public investment in agriculture

SISTAFE – Governments financial management system

SM – Spot Market

SOCREMO – Sociedade de credito de Moçambique

SSA – Sub Saharan Africa

UCB – União Comercial de Bancos (Moçambique)

UEM – Eduardo Mondlane University

UNAC – União nacional de camponeses

USAID – United States Agency for International Development

USD – United States Dollar

VI – Vertical Integration

WB – World Bank

WTO – World Trade Organization

WV – World Vision

1. Introduction

A journey of a thousand miles begins with a single step.

— Mao Tse Tung

The Financial System is crucial for the allocation of resources in an economy across individuals, space and time, channels households' savings to the corporate sector and allocates investment funds among firms. It allows inter-temporal smoothing of consumption by households and expenditures by firms through bank's activities, when there is no substantial competition from the financial markets, and through derivatives and similar techniques of managing risk (cross sectional risk sharing), when there is significant competition from the financial markets (Allen and Gale, 2000).

However, the assumptions considered by the classical theory, the competitive ideal, leaves out of account a number of increasingly important factors: agency problems between financial institutions and their customers, incomplete markets, transaction costs and asymmetric information. Due to those factors the companies internalize financial tasks themselves (e.g. investments are financed through retained earnings) to compensate the limitations of financial markets and intermediaries (Allen and Gale, 2000).

Do all types of companies are able to internalize financial tasks themselves? The new companies, since they do not have any retained earnings on their early stage, depend on the external financing at some extent to start up. The smallholders are another type of entrepreneurs without this capacity. Hence not all types of companies can exercise the compensation function. The ones that are large enough and satisfy the formal financial sector's requirements are the ones eligible to credit. Those companies will most probably be the ones involving medium or large scale activities.

The Agro-industries is the type that can be able to get external finance on their early stage. Their particularity, which gave this study a topic to research on, is that they can on their turn give credit to their subordinates, their growers. These types of companies are characterized by, through vertical coordination with growers, buy and adding value to agricultural commodities through processing before they reach consumers. Four main types of arrangements are mentioned by theory: Spot Market (SM), Contract farming (CF), Vertical integration (VI), and Farmer Cooperatives (FC) (Rehber, 1998).

Rural agro-industrial development has the potential to help reduce the rural poverty level, which for Mozambique is about 71% in about 80% of the country's population living in rural areas. The influence of a particular agro-industry in a given region varies depending on the set of factors that condition the relationship between the agro-industry and rural smallholders, from the crop specific characteristics to the economic and politic environment. The rural smallholders can benefit in terms of wage employment, increased income from the supply of raw material to the processing firms (Benfica, Tschirley and Sambo, 2002).

Among the four institutional arrangements between the contractors and smallholders, mentioned above, matters only to the current study the CF contractual arrangement due to the fact it entails relations between growers and contractors that substitute for SM transaction and VI types of integration. A standard farming contract regulates in advance the price, production practices, product quality and credit facility among others (Rehber, 1998). CF is referred to a system where a contractor purchases the harvests of independent. The contractor frequently provides credit inputs and technical advice to the producer (Baumann, 2000).

The attention given to the CF is also related to the many economic reforms in developing countries that have reduced public expenditure on credit programs, staple crop price supports, input subsidies and government research and extension programs (Key and Runsten, 1999). It substitutes, on one hand, the SM transaction alleviating the high marketing costs, fluctuating prices and information asymmetries problems, resulting from the poor endogenous political and economic factors in Sub Saharan Africa (SSA), and on the other hand, the VI, reducing the likelihood of excluding large number of smallholders which would be high due to the adoption of high volumes of investments and the adoption of significantly high capital/labour ratios in production (Benfica, Tschirley and Sambo, 2002).

Under this situation the arrangements of the CF's credit schemes would be like a torch in the dark for the smallholders, which are restrained on access to traditional credit institutions. Thus research efforts towards a better understanding of that relationship and the potential it has to overcome the problematic access to credit experienced by the smallholders, to improve the real sector's productiveness, and even to improve the infrastructural setting of the rural areas and lead to a development of a rural financial system, is relevant not only for the micro level, but also for the policy decisions.

1.1. Presentation and motivation

The Mozambican overall credit distribution, under the traditional financial system, among the different sectors of the economy is characterized by the stylized fact that higher percentage of the credit is channelled to the industry and commercial (an average of 29.99% and 20.31% respectively, during the 1998-2001 period) activities, which are not considered the main *clutch* for the development in some developing countries. Here the productive sector, specifically the agricultural sector, has been getting low percentage of the overall credit distribution (an average of 19.18% during the 1998-2001 period), in spite of being considered the activity that employs most of the (rural) population and the main *clutch* for the development of the country.

Table 1.1 Sectored credit distribution, 1998-2001 (in MZM[1] 10^6)

Sectors	1998		1999		2000		2001	
	Value	%	Value	%	Value	%	Value	%
Agriculture	1,220,812.00	20.98	1,675,196.00	19.86	1,894,657.00	19.07	2,486,830.00	16.80
Industry	1,718,482.00	29.53	2,463,797.00	29.21	2,676,773.00	26.94	3,296,171.00	22.26
Construction	277,992.00	4.78	395,233.00	4.69	449,671.00	4.53	507,108.00	3.42
Tourism	n.a.	n.a.	68,918.00	0.83	216,873.00	2.18	433,251.00	2.93
Commerce	1,470,807.00	25.27	1,864,832.00	22.12	2,027,907.00	20.42	1,987,667.00	13.43
Transport. and Communications	363,831.00	6.25	426,078.00	5.05	519,216.00	5.24	931,429.00	6.29
Other	767,295.00	13.19	1,537,572.00	18.23	2,149,155.00	21.63	5,162,084.00	34.86
Total	5,819,219.00	100.00	8,433,615.00	100.00	9,936,216.00	100.00	14,806,541.00	100.00

Source: ACP, 2003.

As can be seen on the Table 1.1, agricultural sector has been receiving a considerable level of credit from the economy. But when we look at the distribution of the credit by crops, on the Table 1.2, clearly comes out the higher allocation of the credit to the cash crop industry (the large agricultural companies and the agro-industries) producing cotton, cashew and sugar (an average of 23.44%, 13.18% and 7.42% respectively during the 1998-2001 period). Under this framework and considering that major part of the national agricultural produce comes from family farms, absorbing most of the working population, the agricultural companies and the agro-industries seems to be in better position towards the formal financial system (for credit) than the smallholders.

Table 1.2 Credit distribution by crops, 1998-2001 (in MZM 10^6)

Crops	1998		1999		2000		2001	
	Value	%	Value	%	Value	%	Value	%
Tea	26,164.00	2.33	37,917.00	3.03	43,956.00	2.43	n.a.	n.a.
Sugar cane	82,683.00	7.36	n.a.	n.a.	137,869.00	7.62	164,813.00	7.26
Cashew	195,554.00	17.42	58,366.00	4.66	277,488.00	15.34	347,206.00	15.30
Copra	51,721.00	4.61	61,638.00	4.92	100,292.00	5.54	273,518.00	12.05
Cotton	208,157.00	18.54	322,517.00	25.74	370,721.00	20.49	658,057.00	29.00
Other	558,480.00	49.74	772,349.00	61.65	878,787.00	48.58	825,675.00	36.39
Total	1,122,759.00	100	1,252,787.00	100	1,809,113.00	100	2,269,269.00	100

Source: ACP, 2003.

[1] MZM stands for Mozambican Meticais, the Mozambican currency, and USD 1 = MZM 20,650.00, on 22.04.2005 In www.bancomoc.mz .

A research towards a better understanding of the credit distribution shown above would probably be taken in different forms. Depending on the approach taken, it would help on one hand understand the reasons of the credit market failure (for smallholder's agricultural activity) and identify different strategies to tackle that problem. On the other hand, it would understand the role of the agro-industry as the link between the formal financial system and the rural smallholder and as the *pivot element* for the development of the rural financial system.

The study proposed will follow the latter approach. Given that major part of the credit given to the agricultural sector goes to the agro-industries, it is crucial to understand the role of the agro--industrial sector for the improvement of the agricultural productivity. Therefore research in order to understand the Agro-industry's credit schemes, specifically CF activity as an alternative (if not the unique) credit source for the rural growers, will be followed. The approach to be taken in the paper will be both, micro and macro perspective, portrayed on lessons learned from the experiences of the Agro-industries and growers located in the Tete province, on the tobacco sector, and from the documented worldwide experiences.

1.2. Objectives and hypothesis

The specific objectives with the study are as follows:

1) Analysis of the factors explaining the credit constraint situation for the rural growers towards the traditional financial sector;
2) Review of different financial options for smallholders as alternative credit source to the traditional financial sector;
3) Understanding of the CF scheme as a credit source and of the factors influencing the credit activity of the scheme;
4) Derive implications for the sector's stakeholders and for the policy makers to take into account.

The following research questions are central for the study:

1) Which are the aspects of the traditional financial systems that hinder the credit supply to the rural growers?
2) Do the Agro-industry's CF schemes provide an alternative source of credit for the grower located in the rural areas in Mozambique?

The hypotheses that will guide this study are given as follows:

1) H_1 –The CF schemes can be considered as an alternative way to reach the rural growers, in terms of financial system's main developmental channel: the credit;

2) H_2 – Growers characteristics, grower's endowment of factors of production and socio-economic characteristics, explain why they are better off under the CF then the other credit systems, specifically the formal financial system, NGOs credit system, Rural Associations, government credit, and retailer credit system.

1.3. Organization of the study

First a general presentation of the country, allowing the understanding of some of the historically existing conditions of the financial and agricultural sector, which are the basis of the thesis. It includes a description of the agricultural and financial sectors, drawing the current status, performance and their relationship. A special section will be devoted to characterization of the rural market, in terms of their functional and organizational aspects and the interaction between the financial and agricultural sectors in this market.

The following chapter aims to present the theoretical grounds of the study. Here a conceptual view of which are the problems arising from market failure, whether its credit, informational, insurance or product markets failures will be presented, under the CF scheme. In addition a characterization of the rural, in terms of the types of vertical coordination existent, of the household decision making process and a presentation of the CF scheme, from the historical background, the factors behind it, organizational and functional points, to the main determinants of the CF scheme.

A description of the methodology used in data collection and analysis, mainly, will be undertaken in the fourth chapter. The next chapter presents case study evidence, from the tobacco growers in Tete province of Mozambique. Following, the study provides an in-depth discussion regarding the potential of the scheme as credit source including the possibility of generalization of the scheme in the way that it can be beneficial for the development of the rural areas. And as final chapter, before the references, concluding remarks will be presented.

2. The Mozambique context

The whole problem with the world is that fools and fanatics are always so certain of themselves, but wiser people so full of doubts.

— Bertrand Russell

This chapter presents the background information about Mozambique, which helps to describe the empirical setting of the study. This contextual background allows understanding some of the historically existing conditions of the financial and agricultural sector, which are the basis of the thesis. The chapter is organized into three broader sections. The first section outlines how the contextual background[2] shapes the financial sector. In the third section, a description of the agricultural sector is provided, drawing upon the current status in terms of existing systems, economic performance and its relationship with industrial sector. The last section is reserved for the characterization of the rural markets, in terms of its structure, operators and both financial and agricultural activities.

2.1. Financial sector

2.1.1. General profile

Historically Mozambican financial sector evolution, since the colonial era, can be grouped and described in the following three periods (de Abreu, 1999; CEA, 1990):

i) ***Origin and consolidation of the financial sector in colonial period:*** which goes till 1975, is characterized by an organization, consolidation, diversification and by a geographical spreading of the sector. The *Decreto-Lei* 45296, of 8th October 1963, was the one that regulated all bank related activities in the *províncias ultramarinas*[3] of that period. The central banks functions were belonged to the Banco Nacional Ultramarino (BNU). The exchange rates were fixed administratively;

ii) ***The transformation of colonial financial system*:** corresponding to the 1975-1986/7 period, it is characterized by the creation of the central bank of an independent people's republic, through an integration process of the banking sector and consequently monopolization by Government of the financial intermediation activities. Limitation of

[2] The contextual background, namely the socio-historic and political profile can be seen in the appendix A1.
[3] How the Portuguese overseas province were known.

financial product's diversification and almost substitution of the financial intermediation role of the financial system by the allocation methods by the central plan of the government The target of the financial policy was unemployment rather than inflation. Interest rates and exchange rates were administratively fixed. Only one private bank was operational, i.e., the Banco Standard Totta de Moçambique (BSTM), in addition to the Bank of Mozambique (BoM) and Banco Popular de Desenvolvimento (BPD). The Mozambican currency, Metical, was created during this period, in 16.06.1980, by the *Decreto-lei* 2/80. Many problems aroused during this period: lack of investment and entrepreneurship's incentives; low returns level on the capital, inefficient resource allocation, 70s petroleum crisis, Golf war and Soviet Union politico-economic crisis; which drove to a reform, the ESRP, in 1987, in order to introduce the market based system;

iii) ***Financial reform under structural adjustment program*:** started in 1987, is characterized by the legal-institutional reform under ESRP, and conducted by the liberalization, diversification of activities within the sector and openness to the privates' initiatives. A reform of the monetary policy's instruments and management mechanisms, privatization of the Government owned banks, openness to the foreign market were also some remarkable evolutions of the period. This period also is characterized by the introduction of new products (e.g. ATMs, credit cards, debit cards) and services (e.g. Stock exchange). The use and standardization of the Check, the computerization of the banks also are worth to mention. The promotion of decentralized credit was another important measure taken by the reform. This period, according to the reform's objectives, can be delimited into fours phases (BoM, 1999):

(a) ***Increase of produce 1987-1990)*:** in order to attain the increase of produce, the government started a liberalization process in 1985 of the agricultural, industrial and services products. A sectored programming of the credit was also realized, defining quantitative ceilings on credit activity of each bank, and interest rate definition by activity sector and credit use was also administered. The central bank accumulated the functions of, additionally to the Central's, commercial banks. A separation of these functions was also an objective of the reform program.

(b) ***Increase of external competitiveness (1990-1992)*:** due to the appreciation of the Metical, through exchange rate adjustments devaluation started, firstly of high intensity, of about 30-40% in semester basis, between 1987/8, and then under

crawling peg method[4], with monthly adjustments of below 5%, between 1989 and 1991. During this period a market based foreign exchange secondary market was institutionalized and many started this activity. Interest rate liberalization was also another important measure of this period, in addition to the separation of the central bank's commercial function;

(c) ***Inflation control (1992-1997)*:** as a result of the exchange rate liberalization, the inflation rate climbed in 1991 to worrying levels. In order to control it the BoM opted by introduction of the liquid internal assets method (as difference between M2 and liquid external assets) for the ceiling setting on the bank's credit activity. From 1996, as result, the inflation level became attractive for the private investors, both domestic and foreign, in addition to functional foreign exchange law, controlled budgetary system and continuous and accelerated GDP growth;

(d) ***Increase of liquid foreign reserves of the BoM*:** with the creation of the Inter-bank exchange market in the end of 1996, the need for the existence of a certain level of external reserves, measured in terms of import months, was clearly spotted. As a result of the reduction of the reserve rate to 12%, in 1997[5], and the role of lender of last resort played by the BoM created two major problems: liquidity increase in the financial sector and pessimism of the operators about the sustainability and stability of the foreign exchange market. In order to overcome this issue the inter-bank money market was created. And two committees were created in order accompany the monetary and exchange policy definition and implantation: CPMC (Counselor for Monetary and exchange policy) and CCMI (Coordination committee of the inter-bank markets).

Currently the financial structure of the Mozambican financial system is regulated by the *Lei nº* 15/99, of 1st November. It regulates and groups all the financial activities in two major types of institutions: *the credit institutions*, which comprise of banks, credit cooperatives and other which by law are considered institutions; and *the financial societies*, which comprise factoring, investment funds management, brokers, assets management, exchange bureaus activities and others classified by law as financial societies (Parliament Assembly, 1999).

The financial sector currently is constituted by, in terms of credit institutions, Banco Internacional de Mocambique (BIM), Banco Autral (BA), BSTM, Banco Comercial e de

[4] It is a method used to achieve one desired adjustment in the currency exchange rate (up or down) by small percentages over a given period, rather than by major revaluation or devaluation. Some countries use a formula that triggers a change when certain conditions are met. Others change values frequently to discourage speculations.
[5] Currently the reserve rate is 9%.

Investimento e de Fomento (BCIF)[6], Banco Internacional de Comercio (ICB), Uniao Comercial de Bancos (Moçambique) (UCB), African Banking Coorporation Mazambique, Banco de Desenvolvimento e Comercio de Moçambique, Banco Mecantil de Investimento (BMI), Novo Banco, Cooperativa de Credito e Investimentos (CREDICOOP), Cooperativa de Poupança e Credito (CPC), Tchuma – Cooperativa de Poupança e Credito, Banco Efisa, HSBC Equator Bank and about 12 small credit entities. And in terms of financial societies by BIM Investimentos (BIMI), BIM Leasing (BIML), BCI Leasing, African Banking Coorporation Leasing, Compras em grupo de Moçambique (CGM), Sociedade de Credito de Moçambique (SOCREMO), Sociedade de Gestão e Financiamento para a promoção da pequena e media empresas (GAPI), Sociedade de Capital de Risco and about 30 exchange bureaus (BoM, 2005). There also exists the Stock Exchange of Maputo.

2.1.2. Credit market

> Lending to priority sectors at extremely low interest rates to stimulate economic activity had been the theme of monetary policy in Mozambique between 1981 and the introduction of the E(S)RP, and it continued to be a feature of the normal commercial credit system under E(S)RP. In particular, agricultural credit has attracted lower interest rates throughout the 1987-1990 period. At the start of 1990, for example, agricultural credit rates for 90 day loans were 15% compared to the 29% and 28% for the industrial and commercial sectors respectively.(CEA, 1990b:104)

The extract above enlightens that credit policy, while the centrally planned system was ongoing, was basically based on administrative judgement and queuing mechanisms. Here the allocation of credit, definition of credit ceilings and definition of the interest rate (highly subsidized for the agriculture) for all the sectors were administrative, as a normal practice. With the ESRP, a change to the market based system and the commercial principles in the assessment of the credit are the ones ruling the credit activity of the banking sector. This raises many problems for the family sector, which are the most of the smallholders of the rural area, due to their inability to fulfil the commercial requirements of the credit. The credit activity in rural area of the country can be grouped, under the formal options, in three categories: i) Commercial banks; ii) Government or guarantee funds; and iii) Micro-credit institutions. Under the informal options there can be found three categories: i) *Xitique*; ii) goods as credit; and iii) Input as credit.

The commercial banks are the main credit suppliers in the country, contributing with about 90% of the formal credit given to the economy, which grew in about 13% in 2001(KPMG, 2001). However, the agricultural activity has been funded by the banks through companies, where the

[6] Recently formed as merger od BancoComercial e de Investimento e Banco de Fomento.

rural traders and agro-enterprises are the ones worth to mention. The expansion of number of banks (and their branches throughout the provinces) has not been paced up with the increase of baking services in rural areas, especially in the credit activity. Instead the credit has been channelled to sector with high *credit rolling*, like commerce and services, minimum risk and the ones that have real guarantees and technical-financial sanity. On average more than 60% of the credit given through the banking system was as short term credit, during the 1998-2001 period (ACP, 2003; DNCI, 1999).

Under the ESRP, in 1886, the government created Government funds for credit in order to fund the rural sector enhancement from which the following are mentioned: i) FFA (Fund for agriculture foment); ii) Commerce fund; iii) FARE (Fund for economic rehabilitation aid); iv) FDHA (Fund for hydraulic agriculture development); v) FFP (Fund for fishery foment); and vi) FFPI (Fund for small industry foment). Among all these only the first three included aid to agricultural activity. The total amount on these funds till present is approximately USD 72 millions, from which only USD 61 millions were used. It financed around 180 projects that created 4210 jobs and maintained about 12000 jobs (Maleiane, 2002). As for the achievement of these funds there is a huge gap between the objectives previously defined and the ones achieved the recovery rate is low as result of increased credit not recovered, funds misapplication and lack of experience and readiness of the project managers on the projects analysis and credit monitoring (Maleiane, 2002).

Initiated as aid projects to vulnerable population, war and natural disaster victims, implanted by the NGOs (Non-governmental organizations) with donors' funds, the Micro-financial activity had as main objective to guarantee, through credit, minimum necessary resources to those already mentioned. Now it targets the low income urban and peri-urban areas population constrained to the formal credit. Even though it is in its initial phase, in institution and management view, it has conquered out many *fans*. Currently there are thirteen donor agencies, since 1992, and about USD 4.2 millions in terms of funds (DNCI, 1999). In terms of sectors they provide mostly to informal commerce (57%), agriculture (18%), manufacturing (15%) and services (10%), which shows its credit to consumption tendency rather than production (ACP, 2003). Their credit value range from USD 24 to USD 600, and interest rate charged by them range from 50% to 100%, though not felt by the borrowers due to the short term of the credit. It is estimated that about 30 micro-financial institutions are operating, from which World Relief international, CCCP, CARE, Tchuma, SOCREMO and Novo Banco are considered the major ones (CARE, PNUD and ICC, 2000).

Xitique is a kind of forced savings in daily, weekly or monthly basis, realized normally by group of 4 to 10 persons, into a common fund which is given in a circular form to each member of the group. It works on the basis of trust and happens normally between neighbours, work mates and even close friends. The goods as credit[7] is mostly practiced in rural and peri-urban areas, where instead of getting the fund as credit, the good itself is given as credit. This type of credit is mostly practiced under the livestock sector. The input as credit is the one that matters the most for the current study. It is practiced by big agricultural businesses, agricultural traders and by the agro-industrial sector on the cash crops like cotton, tobacco and sugar. Here the credit is given in the form of agricultural inputs, technical assistance and capacity building and depending on the specific case, these inputs are recovered, on harvest, buying the crops (discounting the input values) or by monetary repayment (ACP, 2003).

As shown in the Table 1.1, agricultural sector has been receiving a considerable level of credit from the economy (an average of 19.18% during the 1998-2001 period). But on the distribution of the credit by crops, on the Table 1.2, clearly comes out the higher allocation of the credit to the cash crop industry (the large agricultural companies and the agro-industries) producing cotton, cashew and sugar (an average of 23.44%, 13.18% and 7.42% respectively during the 1998-2001 period). Under this framework and considering that major part of the national agricultural produce comes from family farms, absorbing most of the working population, the agricultural companies and the agro-industries seems to be in better position towards the formal financial system (for credit) than the smallholders.

Under the problematic issue of the formal financial system's credit access by the family sector, the banking sector emanates the following reasons, as the one in the origin of the problem (DNCI, 1999):

i) Agriculture's high risk due to its dependence to the climate, aggravated by the fact that the country is cyclically affected by natural disasters (e.g. droughts , floods, insect plagues);

ii) High costs associated with the selection and monitoring the credit beneficiaries of rural areas;

iii) High risks associated with the low level of schooling and knowledge of business modern practices of the rural agents;

iv) Smallholders lack of real guarantees and in some cases not existence of the land property and usage title;

[7] This type of credit is practiced by UGC (cooperatives general union) in Maputo, ADRC (Association for development of rural communities) in Gaza, SNV (Netherlands development organization); Concern in Nampula and AMODESE (Mozambican association for development) in Tete, In ACP (2003)

v) Most of the submitted projects are not accompanied by the respective financial plans and its viability study;

vi) And weakness of the existent legal enforcement system.

On the other hand, the farmers point out the following issues as reasons for not expansion of the credit throughout the agricultural sector (DNCI, 1999):

i) High market interest rate and collateral requirements not adequate to them;

ii) Real guarantees requirements that they don't have;

iii) Risk aversion behaviour of the banking sector;

iv) Lack of *political* will on investing in agriculture from the banks part.

A recent poverty report found that about 24% of the households had asked for credit in the last 12 months, and in more than 50% of the cases the loan was asked to family or friends, 16% of the surveyed household went to the informal sources and only 13% went to the bank. The micro credit covered about 10%. About the pattern of the borrowers, it was seen that the illiterates did not asked for loans, the ones with primary schooling went to informal sources and the ones with higher schooling level went to banks. Of the small and medium enterprises surveyed, more than 30% asked for loans, which more than half were covered by the informal sector, 35% by the banks and 35% by projects (G20, 2004).

2.2. Agricultural sector

2.2.1. General profile

Agriculture is the mainstay of the economy, yet only 4% of the land area is cultivated. Two-thirds of the people are subsistence farmers, cultivating small plots using hand tools. Maize and cassava are the main staple food crops, but other cereals, groundnuts and beans are also grown. Important cash crops include prawns, cashew nuts, tea and sugar. Unfortunately, due to poor roads, many farmers lack access to markets for their surplus. Fear of hidden landmines also hampers rural development. Many households struggle to meet their own needs poor urban families spend more than 70 per cent of their income on food, and a crop failure can be disastrous for farmers. The basic diet of white maize or cassava made into porridge is high in carbohydrates but lacking in protein, vitamins and minerals (WV, 1999).

Agricultural production is highly dependent on pluvial regimen. The northern region of the country has better potential for agriculture especially for dry land agriculture (risk of 5%), with

exceptions of south of Tete, north of Manica and Sofala, where the harvest risk can get about 50%. The soils on the highlands, here, are in general of slightly argillaceous and frank-argillaceous texture with high natural fertility, which needs maintenance in cultivation conditions. On the south the soils are mostly arenaceous, of low fertility water retention capacity. These bands of deposits of the rivers and its tributaries present one high agricultural potential and represent the majority of the areas recommended for the development of irrigated agriculture (AJAL, 1998).

Mozambique has an enormous potential area for agriculture, estimated in about 36 millions hectares (ha), and only about 20% to 30% of it at maximum were cultivated, being currently about 5 millions ha the cultivated area. With a potential of irrigated lands of 3.4 millions of ha, the most important hydrographic basins are of the Umbelúzio, Incomati and Limpopo rivers in the south, and Búzi and Pungoé in the center, with about 400,000 ha. The area with the most potential is along the Zambeze river, dominating the centre of Mozambique and with the Cahora Bassa dam. Though it's huge potential, in 1987 only 120.000 ha had infrastructures and only 42.000 ha were operational. The irrigated land of Chokwé is the most important of the country with about 25.000 ha equipped to water, though the efficiency level of the irrigate is low, about 25% to 50%, due to mainly lack of technical knowledge (AJAL, 1998).

In about 70% to 90% of the currently cultivated area, the family sector has been developing subsistence agriculture, without inputs and with low income and where the women assumes a relevant role in the production. The large scale private sector has also been important due to its productive and commercialization functions. Exploring about 200,000 ha, this sector has the best productive areas, contributing strongly for the development of the food production and processing industry. The livestock, the main traction source of the family sector, have an important role in the rural economy. They are seen as source of organic material and way of consumption diversification (AJAL, 1998). The main characteristics of the farmers in Mozambique are summarized as following (Compton, 2000): i) Heterogeneous groups, from large scale private sector to small scale subsistence farmers; ii) Poorly organized, no organization can claim to represent small scale farmers at national level[8]; iii) Few farmers are concerned with demanding better agricultural services; and iv) Little real commitment to consultation with smallholder, not respecting and valuing their views.

The agricultural area can be grouped in three vast zones: north, center and south. The north region, as already mentioned, has the higher agricultural potential, with medium altitudes and average annual precipitation between 1,000 e 1,400 mm zones. Maize, *maripa* and cassava are

[8] The National Union of Peasant Farmer (UNAC) aims this role in the long run, In Compton (2000).

the main crops of the plateaus and rice on the costal area. Tea and cotton are crops of high potential and tradition in areas where peanuts and tobacco are common crops. Cashew is predominant on the coast, where the risk of loss due to drought is less than 5%. The center with average annual precipitation between 1,000 and 1,200 mm, and is of medium altitude zone, is mainly subject to the hydrographic basin of the Zambeze river. Maize, cassava, *mapira* and bean dominate the produce, where the cash crops are cotton, cashew and copra. The risk due to the drought is higher that the northern region, and could get exceptionally to 30% to 60% in Tete province. As for the south region, maize, peanuts and cassava are predominant crops, in areas with precipitation between 400 e 600 mm. Cashew represents a very important source of income. In areas potentially irrigated, next to the riverbed, sweet potato and rice are grown, alternatively to barren zones where *mapira* and *mexoeira* are frown instead of maize. Comparatively to the costal area, in the inner land the probability of loss due to drought is rather high. Traditionally it is an area of livestock production, where the proximity to the urban areas facilitates the channeling of all produce (AJAL, 1998).

2.2.2. Economic profile

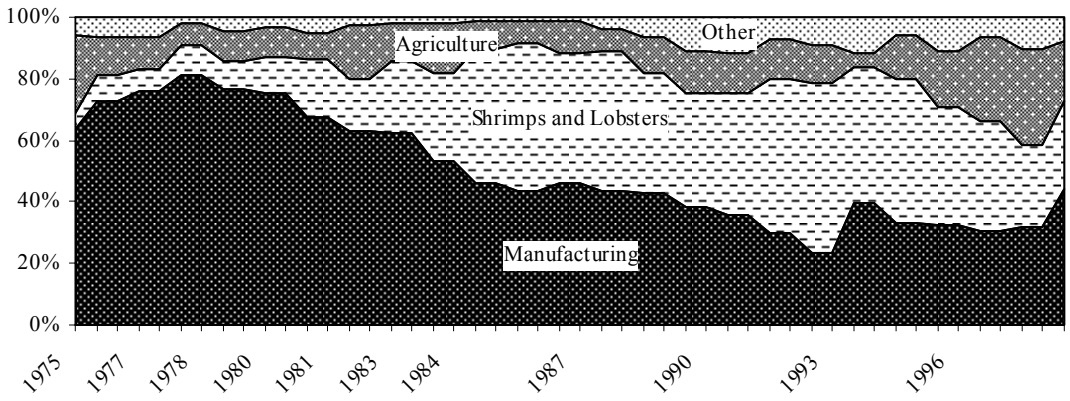
Agriculture is one of the major contributors to the countries GDP and exports. In 2000 and 2001, contributed in 20.2% and 18.8% respectively in the GDP, being the highest contribution (ACP, 2003). An instrument for the coordination of the activities in the agricultural sector and at the same time to effect the changes in the MA needed for it to carry out its new role in a market economy was conceived, the PROAGRI. It based on around eight basic principles, agreed between both government and donors: i) Poverty reduction; ii) Decentralization and empowerment; iii) Good governance – transparency, accountability and participation; iv) Attention to gender issues; vi) Increased attention to rights and needs of smallholder farmers concerning access to land, input and markets; vii) Market oriented policy framework; and viii) MA's activity limited to core functions and strengthened to carry them out (Compton, 2000).

The estimated total cost of the first five year phase of PROAGRI is USD 202 million and till 2000 eight donors[9] had signed up to it. Operationally PROAGRI, integrates eight vertical components: i) Institutional development; ii) Research; iii) Agricultural extension; iv) Livestock; v) Support to crop production; vi) Agricultural land; vii) Forestry and wildlife; and viii) Irrigation; grouped in three thematic areas: Institutional development, Agricultural support services and Natural resource management. There are also ten horizontal components, divided by

[9] The donors were WB, EU, DANIDA, USAID, Netherlands, AusAid, FAO and UNDP.

each province[10]. Till 2000, as a result of the progress assessment, there was a clear picture that there still was a long way to go (Compton, 2000). The challenges faced by PROAGRI are: i) Inability of agricultural sector to resolve problems in isolation[11]; ii) Lack of consensus about the scope, functions and target clients of the MA; iii) Lack of models (or agreed best practice) to institutionalize; and iv) Differing needs of different clients and geographical areas.

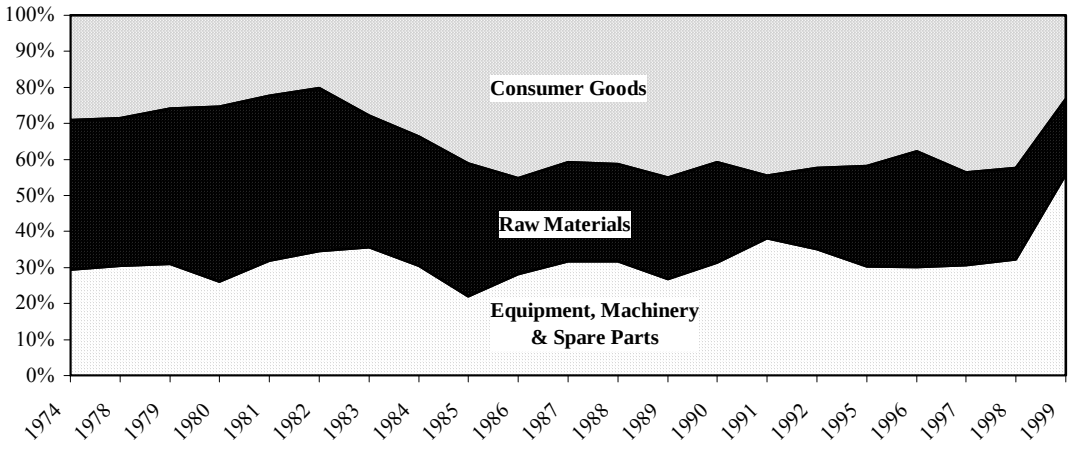
When looking at the export structure of Mozambique it's possible to notice that manufacturing has played an important role in exports, but clearly not a dominant one, though was the single largest exporter of goods until the early 1980s, mainly because of cashew processing (from the early 1970s, and cotton before that) and oil derivatives (Graph 2.1). Quite apart from the fact that service dominates total export revenue. The share of agriculture in exports[12] increased significantly from 1994, mainly because of exports of unprocessed cashew nuts that replaced the exports of processed kernels (Castel-Branco, 2001).



Graph 2.1 Sectored composition of export goods
Source: Castel-Branco, 2001.

PPI's investment program, 1980-82, had an immediate and short-lived impact on increase in imports. The import structure became skewed towards capital and intermediate goods, which, by 1982, represented about 80% of total imports (Graph 2.2). Between 1983 and 1985 imports declined because the investment programme collapsed. Imports of capital goods fell, but imports of intermediate goods declined more dramatically. This was partly due to the falling world price of oil, but also to a general decline in imports of material inputs as, under foreign exchange constraints, these had to compete against capital investment and consumer goods. As a result, the level of under-utilised capacity throughout the economy, in particular in manufacturing, reached its peak (Castel-Branco, 2001).

[10] For more detailed discussion of each vertical and horizontal components see Compton (2000).
[11] Without a market, farmers have little incentive to produce surplus, and on the other hand markets to exist need the production surplus to be available. Three approaches, which does not fit neatly into PROAGRI, have had some success in breaking this deadlock: NGO initiatives to create market associations; decentralized, integrated local planning of local markets; and Outgrower schemes around processing facilities, In Compton (2000).
[12] All agricultural based products that go through some level of industrial processing prior to export (sisal, tea, sugar and molasses, copra, cashew kernels, cotton ginned and spun) are counted as manufacturing exports. Thus, agricultural exports are exclusively unprocessed goods or those whose level of processing is either unknown or insignificant.



Graph 2.2 Sectored composition of import
Source: Castel-Branco, 2001.

2.3. Rural Markets in Mozambique

2.3.1. Family sector and credit needs

The agricultural activity contributes in about 20% to 25% to the GDP, from which about 80% are produced by the family sector. And about 70% of the overall population live in the rural areas on the basis of the agricultural activity. As in most African countries, the rural markets in Mozambique, also are not developed and face, among many set backs to their development, the following major four (Coates, 1999):

i) Dispersion of the population and underdeveloped transport and communications infrastructures, which contributes positively to the unit costs for small transactions;

ii) High risk associated with the crops in dry lands and the difficulties in diversification of that risk;

iii) The seasonality of the agricultural activity increases the risk and probabilities of bad outcome affecting their stakeholders;

iv) Lack of real guarantees that can be used as collateral, normally asked by the banks on lending process.

Among the major concerns of the policy makers is the access to formal financial system and an appropriate marketing structure for the family sector, mostly the rural smallholder. Agriculture, in general, has not been constrained, but the family sector remains almost entirely outside the formal credit system. The operations and traditional production technology of the typical family farm, and its associated credit needs, are too small to warrant the economic extension of the

normal credit system. Moreover, family farms typically do not generate sufficient marketable surplus to justify or service commercial bank credit (CEA, 1990a, 1990b).

Also connected to this problem is the development of an appropriate marketing structure. It seems that the imperfections of the actual marketing structure have resulted from, among others, the exodus of portuguese rural traders at independence (and not been replaced), the security problem and the serious shortcomings in the transportation and financial infrastructure. The behaviour of government policy with respect to pricing, resource allocation and the provision of the appropriate infrastructure are also contributing to the poor rural marketing and financial situation (CEA, 1990a).

The low participation of the family sector in the formal financial system is attributed to the following factors (CEA, 1990b):

i) Little demand for production credit from this sector, since the need for purchased inputs on the typical family farm at current technology levels is minimal considering the subsistence agriculture practiced by them;

ii) With a mix of products marketed throughout the year, most consumption needs can be met without resorting to the credit use;

iii) The low credit level of demand existing makes extremely costly the provision of it through the formal credit network;

iv) Another important drawback to the credit expansion to the family sector is the evolution of the technology used in production.

2.3.2. Rural market

Multiple intervenients are present in the rural commercial circuit (Figure 2.1). There are the *ambulantes* also know as *informal*, the retailers, the wholesalers, the big traders, producers associations and the agro-industries. Each one of them operates and proportionate different access conditions to the market. The market itself can be classified as foreign and domestic, which can be local, regional and inter-provincial (DNCI, 1999). While competition among trader is present at the district level and to a lesser extent in the surrounding rural zones, the more distant are these are frequently characterized by monopolistic and monopsonistic trading. Thus, at the producer level, crop purchase and consumer good sale are often conducted by a single trader (CEA, 1990a).

Ambulantes are part of the informal small traders that buy directly from the farmers and sell to the other agents, the retailers and wholesalers. The retailers and the wholesalers belong to the group of small and medium agent of the formal sector, which can also buy directly from the farmers and producers associations and sell to other retailers and wholesalers, to big traders and agro-industries. They have experience on commerce which allows to measure and manage their participation on agricultural commerce not only on the basis of the market behaviour but also their funding or borrowing capabilities. The big traders frequently pre-finance their buys from the smaller scale agents. The agro-industries intervene on this market strictly to buy what constitutes object of their industrial activity (DNCI, 1999).

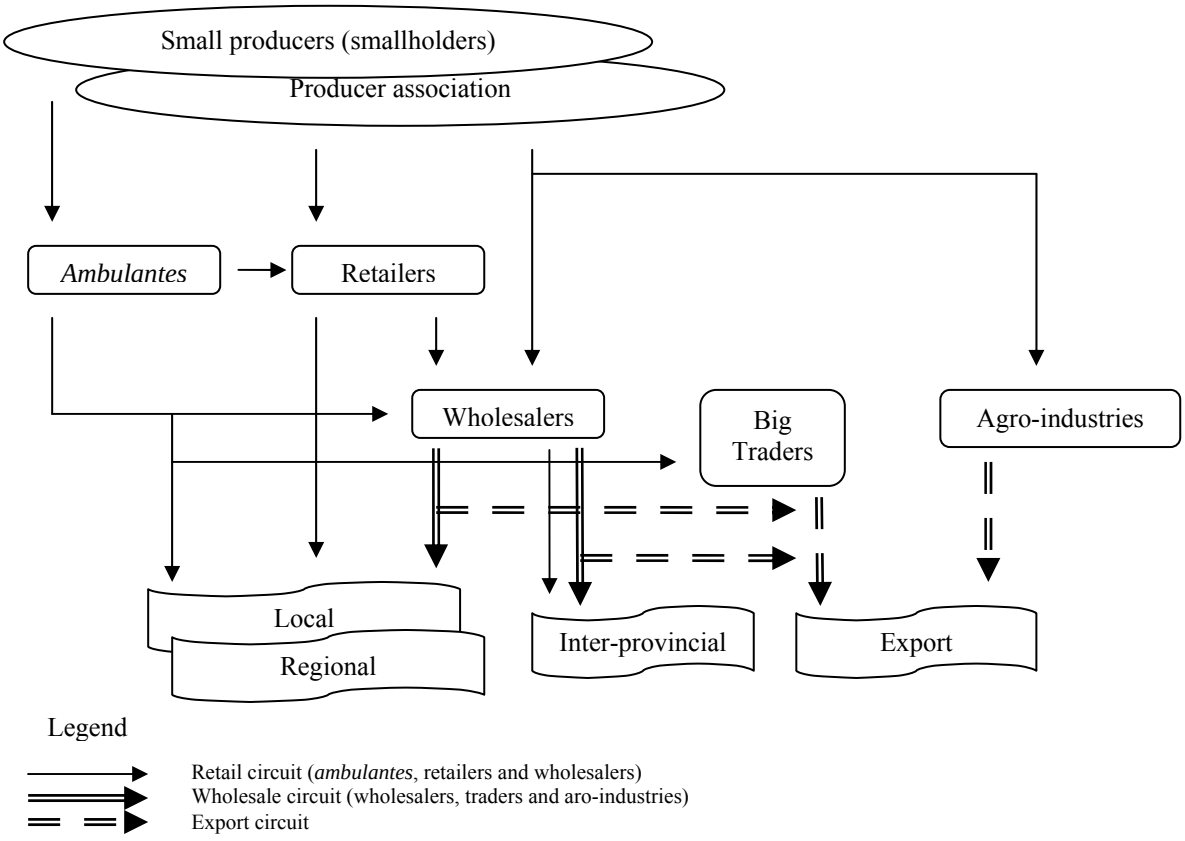


Figure 2.1 Rural market circuit
Source: DNCI, 1999.

In general this circuit is not fully functional due to many constraints in the market. The low level and quality of the family farms, their dispersion and fluctuations on production level, particularly of food crops, makes the commerce activity less attractive to the agents due to the high transaction costs resulted from that, and additionally from the limited information about the markets, difficult access to the production areas. Access to credit, from the formal financial system, underdevelopment of infrastructural and transportation conditions, weak legal system and high bureaucracy, and information asymmetries are also contributing to the market failures (DNCI, 1999).

3. Literature review

Most of the people in the world are poor, so if we knew the economics of being poor, we would know much of the economics that really matters. Most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture, we would know much of the economics of the poor. People who are rich find it hard to understand the behaviour of poor people. Economists are no exception.

— T. W. Schultz (Nobel Laureate Lecture, 1979)

This chapter aims to present the theoretical grounds related to what was proposed, in the introduction chapter, to carry out. Namely it draws upon the presentation of the different types of vertical coordination, characterizing the relation between the grower and the, as the first section. The second section comprises the main theoretical ground, upon which the relationships between two economic agents is analysed, the CF scheme. It presents from the historical background to the main determinants of the CF scheme.

3.1. Inter-institutions relations in agriculture

In Penn's (1958) view, subsistence agriculture was fully integrated system itself since most of the production resources and production decisions are in the same hands. Form the seed collection to the crop harvesting; the rearing and fattening of an animal, and also the consumption after the seed reservation or stocking for the following period is one family's activity. From the subsistence agriculture to the actual market oriented agriculture, a process of disintegration of functions has occurred. The most distinguishing feature of the present agricultural activity is specialization. Adding, Barker (1972) pronounces that agriculture as a production industry is, in one hand, related to the marketing activities that transform, transport and transfer processed produce to consumers, and on the other hand, with the large industries supplying farm inputs. This way coordination between farms and other firms in the industry, both forward and backwards, is inevitable (Rehber, 1998).

The need for more vertical coordination is responsive to the agricultural industrialization movement, which describes the significant structural changes in the food and fibre system (Kirsten and Sartorius, 2002). Among a whole range of changes, two changes stand out: i) A shift from food commodities to food products; and ii) A shift from SMs to more direct market channels, such as production contracts. Two major forces drive the industrialization process: i)

New consumer, i.e., demanding more of quality, consistency and value, than just choice[13]; and ii) New producers, i.e., use of new technology such as bio- and information technology (Drabesntott, 1995). In addition i) Increasing competition from global market participants; ii) Economies of size and scope in production and distribution; iii) Risk mitigation and management strategies of buyers and suppliers; and iv) Strategic positioning and market power/control strategies of individual businesses; also contribute to the industrialization of agriculture (Kirsten and Sartorius, 2002).

A plethora of different institutional arrangements[14] can be found worldwide prevailing in the relationship between productions, trade, and processing. In Mozambique, those forms can be summarized in three different types defined on the basis of the degree of vertical coordination between farmers and off-farm businesses, namely: SM trading (coordination without any contract), CF and VI (ownership integration or plantation agriculture). Out of that continuum but interacting to a great extent in the dynamics of the markets is the FC (rural associations) (Benfica, Tschirley and Sambo, 2002; Rehber, 1998). In some countries, NGOs also play a role, as intermediaries, with the goal of helping those groups become profitable businesses associations. This section intends to describe those different types of institutional arrangements, also existing in literature, between agro-industries and smallholder farmers.

Spot Market Trading

Also named as coordination without any contract and open market transaction, the farmer buys the supplies from whom he chooses and sells his products to whoever will give the best offer in terms of price. The farmers here are independent and have no contractual (neither oral nor written) relations with any agent. This provides them, besides the freedom and flexibility to respond quickly to changes in market conditions, uncertainties about the markets (Rehber, 1998). Jaffee and Morton (1995) added that this type of arrangement provides economies in information as market prices reflect the information that trading parties require to interact efficiently, and that under this arrangement, each of participating parties make independent decisions based on its own conditions, preferences and the information available on preferences and behaviour of others. This arrangement is likely to be spread over larger geographical areas (Benfica, Tschirley and Sambo, 2002).

This type of coordination is ideal for areas with low transaction costs in processing and marketing of crops are low and where various forms of institutional development that support

[13] Resulting from increasing concerns about food safety, link between diet and health and increased urbanization, In Drabesntott (1995).
[14] Institutional arrangements, coordination and vertical coordination will be used interchangeably.

service provision exists, or where factor and product markets operate efficiently (Delgado, 1999). Examples of these types existing in Mozambique include, among others, cashew, maize, and mango sub-sectors. However in most of SSA, transactions costs are high, factor markets (especially for inputs and credit) often fail and service provision is poor. Under these circumstances, reliance on SM transactions can trap smallholders in Schultz's *efficient but poor* conundrum, and leave processors with insufficient and unreliable supplies of poor quality product (Benfica, Tschirley and Sambo, 2002).

Contract Farming

CF is referred to a system where a contractor purchases the harvests of independent and frequently provides credit inputs and technical advice to the producer (Warning and Key, 2002; Eaton and Shepherd, 2001; Weatherspoon, Cacho and Christy, 2001; Baumann, 2000; Porter and Philips-Howard, 1997). Also called quasi integration, a standard farming contract regulates in advance the price[15], production practices, and product quality and credit facility among others. Unlike SM trading, the agreed exchange is in promised goods and services rather than in already produced goods and services. Two approaches exist regarding this type of coordination. One is the British, by Barker (1972), where the CF is viewed as alternative of the VI, which is seen as *ownership integration*. And other American, by Allen (1972), in which CF is viewed as a variant of VI (Rehber, 1998). The British approach is the one to be considered here.

Although it's significance in dealing with market failure, to ease uncertainty on access to market and to sufficient raw material of acceptable quality, and at some extent to reduce price risk, it also slot in some potential limitations like contract enforcement cost can be very high due to opportunistic behaviour of the participants and weaknesses of the existing legal system and highly asymmetric bargaining situation where one or fewer buyers, often with monopsony power, determine the prevailing price. Examples of CF in Mozambique are predominantly found in the cotton and tobacco sub-sectors. These arrangements are best viewed in SSA, on one hand, as a response to widespread failure of input and credit markets and to poor or absent service provision. On the other hand, in addition to its potential limitations, to the need to ensure sufficient volume of purchases to reduce unit processing costs, and concerns about product quality[16] often significantly affect the structure of these relationships (Benfica, Tschirley and Sambo, 2002).

[15] Prices can be set as following: (government) administered prices, (processors or growers) fixed price, free bargaining system (which varies from flexible prices, calculated on SM values, on a consignment basis to split prices) and revenue sharing system, adapted from Eaton and Shepherd (2001) and Baumann (2000). See appendix A.7, for more details.

[16] Product quality concerns tend to become relatively more important determinants of the structure of these relationships in more developed market systems, where input and credit market failure may be less of an issue.

Vertical Integration

This type of coordination, also known as ownership integration and plantation agriculture, refers to the situation when each individual farm loses its identity and becomes a company-owned farm, which owns or leases the land, buildings and equipment and has its own employees (Rehber, 1998). Here two or more separable stages of production or marketing are combined under common ownership and management. Integration can be complete (encompassing all vertical transactions in the sub sector), or partial if it involves at least some sales (or purchases) of the intermediate products to (or from) outside agents, according to Jaffee and Morton (1995) (Benfica, Tschirley and Sambo, 2002). Plantation agriculture, being the second predominant[17] type of coordination in the Mozambican context, accounts in agro-industries involved in the processing of crops and has concessions of land for direct production of the crops. Examples of this type include the sugar, tea, coconut, rice and citrus sub-sectors.

Williamson (1979) and Coase (1973) say that logistical and informational costs associated with the procurement of raw materials and the sale of outputs is saved under this coordination system. It also allows, by internalizing flows of intermediate inputs, the easing of certain risks associated with variability of suppliers and quality. Additionally, like CF, VI can be an effective response to market failure, particularly in early stages of market development. Looking at its weaknesses, they are related to social as well as private costs. The social costs are related to the reduced tax revenue and market concentration[18]. Private costs come in when cases like for example scale incompatibility of adjacent stages of production or trade are likely to have higher costs to the integrated systems than to the non-integrated ones (Benfica, Tschirley and Sambo, 2002).

Farmer cooperatives

Rehber (1984) defined an agricultural cooperative is an organization usually incorporated, owned and controlled by agricultural producers, which operates for the mutual benefit of its members as producers or patrons (Rehber, 1998). This type of coordination is also known as community integration or rural associations and cooperatives. In general, associations can be formed by farmers, processors, wholesalers, retailers or exporters, in order to undertake joint investments, common practices, or collective self-regulation of competition. Holloway, Nicholson, Delgado, Staal and Ehui (2000), Candler and Kumar (1998) and Jaffee and Morton

[17] For characterization of Mozambican agro-industry see appendix A.2.
[18] The different treatment given to the transactions realized within the firm, relatively to the ones realized with market, by the government, gives the firms space to evade or at least minimize the effects of taxes and market controls.

(1995), acknowledged that the FC result as means to overcome liquidity constraints, information asymmetries, and minimum scales of production or marketing that can hinder smallholder participation in rapidly growing sub-sectors (Benfica, Tschirley and Sambo, 2002). The agents in the group agree to act together in order to maximize their joint and individual interests. Any profits from processing are more likely to be spent or reinvested locally, rather than expatriated or spent on non-local tradable, strengthening the consumption linkages, multiplier effects, and potential poverty alleviation.

Jaffee and Morton (1995) recognized that this type of agreement supports commodity system investment and coordination because it can i) Counter the problem of lumpy investments in marketing infrastructure and services; ii) Serve to internalize certain externalities and allow for private provision of certain public goods such as market information and extension services; iii) Reduce or pool member risks by guaranteeing commodity purchases and sales on behalf of members and by providing insurance and/or credit to members; iv) Lower transaction costs for members and non-members trading with members; and v) Exercise or counter market power for its members through collective negotiation with suppliers or buyers, by controlling member supply into the market and by informing members about prevailing terms of trade (Benfica, Tschirley and Sambo, 2002).

It also has some drawbacks, like the free rider[19]problem, by both outsiders and members (by taking actions that yield them benefits above their proper share or reduce their contribution to group costs). Another drawback is related to the size of the association, which is important determining the size of the costs and benefits. Small groups implies large share of the benefits and substantial contribution to the costs among members, which promotes the commitment and gives higher bargaining power. But it also implies high covariant risks, limiting the potential for cooperative insurance and credit supply. Large groups, on the other hand, are associated with economies of scale, and greater scope for pooling and spreading of risks. However, asymmetric information will prevail turning difficult to monitor behaviour and detect free-riding by and among members (Benfica, Tschirley and Sambo, 2002).

At present in Mozambique there is a concerted effort toward sustainable rural development initiatives among voluntarily established groups of households. These efforts, involve the identification by NGOs of opportunities for the development of small to medium scale agro-processing firms with potential for increasing agricultural productivity while promoting the emergence of sustainable community-led agro-businesses in the medium to long run. The NGO contributes in: i) Aiding the organization and formalization, as sustainable businesses, of the

[19] The free rider problem refers to a situation where an individual receives the benefits of a public good or a positive externality without contributing to the production or bearing the costs of producing those benefits.

farmers associations; ii) Introduce and supply facilitation, some units, of a viable processing technology to the community; iii) Supplying seeds and promoting seed multiplication initiatives, and providing technical assistance through an extension network within the communities; and iv) Facilitating market linkages, both backward and forward, for the established associations. An effort in linking producer associations with large-scale processors in CF scope is also targeted, in the sunflower, sesame, maize, cashew and cassava and other tubes sub-sectors (Benfica, Tschirley and Sambo, 2002).

3.2. Contract Farming

Contracts in a general and incomplete sense are found in agriculture everywhere in extremely heterogeneous forms. Simple market specification contracts or future purchase agreements (typically determining price, quantity and time of delivery) are common and labour contracting, supplying labour and machinery have a wide application in agriculture (Wright, 1989). CF or contract production, however, must be distinguished from the multiplicity of simple marketing or labour contracts. Specifically CF entails relations between growers and private or public enterprise that substitute for SM transactions between family farms and a processing, export or purchasing unit. A standard farming contract regulates in advance price, production practices, product quality and credit facilities, etc (Coulter, et al., 2000; Rehber, 1998).

Of course CF is not a panacea to solve all related problems of agricultural production and marketing systems. But it could be evaluated as a form of structural convergence between First and Third World agriculture and also as a way of achieving a higher synthesis between agriculture and industry. In the Clapp, Little and Watts (1994) view, CF is offered as a vehicle for the transfer of technology, modernization of peasant smallholders, and the creation of a stable and politically conservative class of family farmers. Overall, CF has spread enough that it can be considered a significant road of capitalist development in agriculture (Rehber, 1998). CF represents an expanding and much suggested method of agro-industrial integration for developing economies. CF is depicted as a method by which agriculture in the developing world is converging with that in the developed world (Watts, 1992).

In order to explore CF, this section will discuss the historical view of the CF, the reasons behind the popularity of CF, which structure is suggested by the literature and experiences so far reported in terms of evaluation, impact and other studies of CF.

3.2.1. Historical perspective and conceptualization

CF, as an institution in agriculture, has a long history. According to Watts (1994), this sort of coordination date since contracts were employed by the Japanese colonial state for sugar production in Taiwan in the period after 1885 and by the USA banana companies in Central America in the early part of the twentieth century. By the late twentieth century, however, across much of Western Europe (according to Barker (1972), the earliest record of forward purchase agreement is dated 1878), North America and Japan, CF became an integral part of the food and fibre industry. In advanced capitalist states, it seems that CF was widely used by the fruit and vegetable canning industry, besides the colonial Africa, in North America and by the seed industry in Western Europe in the 1930s and 1940s. In the recent three decades, as said by Ghee and Dorall (1992) and Glover (1994), CF is viewed as the promising institutional innovation to improve agricultural performance in LDCs, and as a key element of rural development[20] and/or settlement projects, ensuring the self sustained development, through price incentives delivery, technology and other agricultural inputs (Kirsten and Sartorius, 2002; Weatherspoon, Cacho and Christy, 2001; Key and Runsten, 1999; Rehber, 1998). CF is now a common organizational structure in many countries.

Many definitions can be found for CF. The one classic definition provided by Roy (1963) refers to contractual arrangement between farmers and other firms, whether oral or written, specifying one or more conditions of production and/or marketing of an agricultural product. Glover (1984) suggests, in Roy's definition, as excluding a marketing arrangement such as forward contracts, two conditions must be added. First, contracts should be non-transferable and second that the term "and/or" should be replaced by "and", which means the contract must specify one or more conditions of production and marketing (Rehber, 1998). Specifically farmer's contracted to grow crops for a central processing or export unit, and he provides land, labour and tools, and is supplied with inputs - fertilizer, seeds, and insecticides on credit – and often extension services also (Porter and Philips-Howard, 1997).

According to Glover (1992) worldwide applications in practice have caused to appear different terms and connotations regarding CF in the related literature, making it difficult to say whether CF is used only for a private sector scheme, where the aims and the structure of it are almost similar and rather definite, while some other terms are used for different applications or not. Those connotations are as follows (Eaton and Shepherd, 2001; Baumann, 2000; Rehber, 1998)[21]:

[20] Rural development is considered helping rural people set the priorities in their own communities through effective and democratic bodies, by providing the local capacity; investment in basic infrastructure and social services. Justice, equity and security; dealing with the injustices of the past and ensuring safety and security of the rural population, especially that of women, In _____ (1997).
[21] See on the appendix A8, the adapted characteristics table from Eaton and Shepherd (2001).

i) ***Outgrower Scheme***: also connoted as centralized model, is developed generally as government scheme. The government usually has a public enterprise purchasing produce from farmers on its own or as part of a joint venture with a private firm. It is characterized by having a hybrid structure and multiple objectives. This term is frequently used in Africa and Asia.

ii) ***Nucleus-Outgrower Scheme***: This is a variation of the Outgrower scheme in which there is a project authority which has or administers a plantation adjacent to the processing plant. This plant supplements its own plantation production by contracting in different proportions.

iii) ***Multipartite*** or ***Satellite Farming***: This is also used in referring to any of the variations of the schemes mentioned above. The term multipartite arrangement is used to emphasize the scheme in which several organizations such as private firms, government and foreign aid agencies are involved.

iv) ***Informal developers***: involves informal production contract, normally seasonal, by small companies or individual entrepreneurs. It involves greater risk of extra-contractual marketing.

v) ***Intermediary scheme***: the term intermediary comes from the action of the integrator subcontracting linkages with farmers to intermediaries. Integrator usually is from the private sector.

Several types of contracts are distinguished according to the number of decisions influenced, sharing of the risks and specifying contract terms. From the production decision or management point of view, two types of contracts are determined (Rehber, 1998).

i) ***Limited Management Contracts***: In this type, the farmer signs a contract to beneficiate from production inputs. There is not any real guarantee for the price. The farmer's responsibility is limited only for the production inputs which he has gotten under agreement.

ii) ***Full Management Contracts***: In this case the farmer and the integrator firm have made a contract based on a certain amount of production. In this type of contract the farmer has to follow some provisions specified in the agreement. In this way, the producer provides a certain market for his product and insures himself against risks.

Also worth to mention are the classification made by Kohls and Uhl (1985), which constitutes three broad categories (Eaton and Shepherd, 2001; Baumann, 2000; Rehber, 1998):

i) ***Market Specification Contracts***: Both, grower and integrator agree to terms and conditions[22] for the future sale and purchase of a crop or livestock product, at planting time. Little or none of the farmer's management decisions are transferred. From the producer viewpoint, they guarantee a buyer if the specifications are met.

ii) ***Resource Providing Contracts***: In conjunction with the marketing arrangements, the integrator provides production resources with certain conditions, technical and managerial advice and supervision. Product prices are usually based upon the SM and income guarantees to the producers are minimal.

iii) ***Management and Income Guaranteeing Contracts***: The grower agrees to follow recommended production, inputs, cultivation and harvesting and marketing stipulations of the integrator. Market and price risks are transferred from farmers to integrators in this type. The integrator takes a substantial part of the managerial responsibility of the farmers.

Considering all mentioned above about CF, a fair contract should contain reciprocal obligations with a balance between the rewards and the risks accruing to each party. A production contract should at least contain the following provisions: i) Define the parties; ii) Type and quality specification of the produce; iii) State the quantity of the produce[23]; iv) Specification of the responsibilities of both parties concerning production and marketing practices; v) Indicate the manner, including timing, of delivery or collection; vi) Determine the price[24] (specific or formula) or other consideration and indicate the effects of variations in quality, quantity or manner of delivery and also specify the manner and timing of payment; vii) Specify the duration of the contract and the way in which it may be terminated and/or renewed; and viii) Appoint an arbitrator or otherwise specify how disputes are to be resolved (Eaton and Shepherd, 2001; Rehber, 1998).

3.2.2. Reasons for Contract Farming

The open market transaction form of organization and price determination would remain the appropriate way of coordinating the links in the system if some conditions could occur such as: i) Production closer to the consumption points; ii) Control over short-term variation in prices and sale volumes either through government or producer organizations; iii) Grading standard setting,

[22] It includes product quality measures and quantities which will be acceptable to the integrator and also some regulations on the price and the method of payment

[23] Contracts could be signed on acreage or tonnage basis. Processors bear the yield risk if the contract is signed on an acreage basis, otherwise the farmers bear the yield risk

[24] According to Buccola and French (1981), price is frequently a variable left in contracts. Fixed or negotiated prices are used in contracts. Sometimes contract prices are established by a scale or formula that relates the contract price to various economic indicators, In Rehber (1998).

by the producer group, follow the markets requirements[25]; iv) Agricultural extension and advisory services which are running as government functions are sound and effective; and v) the hidden hand of the pricing, which controls the market mechanism (Rehber, 1998). But, all those conditions of the system are not likely to be satisfied simultaneously, i.e., its subject to market failures It could be changed to a more controllable decision-making mechanism by the private sector via group action such as FC, VI or CF. Additionally, recent sophisticated ideas such as environmentally sound, sustainable and economically viable agriculture are the propellers behind the fast growth of contractual arrangements (Rehber, 1998).

The motivation driving the coordination of CF type, mentioned by Harryman (1994), Buccola and French (1981) and Roy (1963), is aspiration of securing the quality and quantities of commodities exchanged and to reduce the economic terms of trade. Moore (1994) added that CF, viewed as way of commercialization and industrialization in agriculture, will help the small family farms and farm labourers who need capital and managerial assistance. Harryman (1994) and Roy (1963) point that CF is also attractive, from the industry view point, due to the ability to guarantee a steady flow of raw material, unlikely to happen in open market purchases, in order to sustain stable unit costs. They and Rehber (1998) as well, added that CF is seen as a sound way to push technological innovation, improving producer management skills and providing more efficient production processes, keeping pace with the rapidly improving production technologies. Another main important force behind CF is changes in the market structure[26] which need to be paced (Eaton and Shepherd, 2001; Rehber, 1998).

By utilizing Outgrower rather than engaging in direct production themselves, companies reduce their costs while maintaining control over production. Evidence from North Pondoland sugar scheme in South African former Transkei (Eastern Cape) shows that there are – not surprisingly – plans to disband more of the core estate to outgrowing. This process may be accelerated by the labor disputes. Another important advantage of CF to be considered, described by Goldsmith (1985) and Glover and Kusterer (1990) is the potential dangers of union intervention for the companies (Porter and Philips-Howard, 1997). Along with a variety of related problems such as delays in delivery or payment, quality deterioration, etc., which are emerging from the applications, CF generally also has some disadvantages or problems as a production system. Although one of the economic factors favouring the increasing use of production contracts is the need to realize efficiencies through risk management, CF creates its own risk, despite reducing others, varying according to the physical, social and market environments (Eaton and Shepherd, 2001; Rehber, 1998):

[25] Assuming that the market requirements, in terms of quality and quantity, meet the standards required by the purchaser.
[26] Market structure involves quality requirements, quantity requirements and market share, among many others.

i) As Kelley (1994) affirmed, for the producer, the failure to produce on contract standards will result in loss of the contract's premium prices. Other risks include the non-renewal or termination of contracts, perhaps for non-economic reasons. For the processor, the main risks are the failure to line up supply, or losing timely reception of desired quality and quantity of product, loss of technological advantage, and liability to the producers and to third parties.

ii) The farmer loses his independence to some extent varying with the contract conditions. That means the farmer's management function is transferred to another person. It is arguable that a skilled farmer may worsen his circumstances under a contract compared to taking his chance in an open market.

iii) It is a fact that contracting is a negotiation between unequal, economically powerful agri-business and rather weaker farmers. But farmers can cooperate to gain bargaining power to ensure fair contract terms. As said by Ling and Liebrand (1995), by working together in their cooperatives, farmer-members can better control their own economic destiny.

iv) If the integrator has gained a monopsony position, he could abuse his own position to violate contract provisions on his favour. That means when alternative marketing opportunities are closed out, an overly integrated firm or sector may beat down the terms of the contract, which isn't a desirable consequence for improving agricultural marketing.

The controversial nature of CF schemes in Africa (and elsewhere) has been emphasized also by Carney and Watts (1990) and Watts (1994), who points to the widespread manipulation of contracts by large companies and the growing household tensions generated by this externally induced change. They also regard the basis of peasant contracting as essentially self-exploitation, since farmers are forced to labour more intensively (longer hours) and more extensively through the use of child labour. In addition, Little (1994) argues that CF is exploitative when it involves a highly unequal power relationship so that contract farmers are relegated to the status of hired hands. Furthermore, Watts, Little, Billings and Jaffee (1988) accept that net farmer incomes are generally increased by participation in contracting schemes though equity is reduced. In similar vein, Clapp (1994) refers to CF as a form of giving the farmer an illusory, though formal or legal, title to land and labour (Porter and Philips-Howard, 1997).

Government intervention and subsidization policy could be seen as an alternative to CF. However, in the developing countries public interventions and support policies are ineffective and do not help to remove the obstacles mentioned above. Government efforts to subsidize are also mostly in favour of large farmers. At this point the *New World Order* of global restructuring

of the food industry symbolized by World Trade Organization (WTO), which are mainly aiming at lessening or cutting agricultural subsidies, must be taken into account (Rehber, 1998).

Rehber (1996) pointed out that the majority of farms are small and subsistent and that they are potentially an important source of growth in agricultural production and small scaled agriculture has some socio-economic advantages. But, serious constraints on small farm production exist, related to problems of access to production inputs and services (factor and product market failures), and information (information market failure). Small farmers often lack the necessary production and marketing information particularly about the new crops and varieties. Even with sufficient information they do not have enough financial resources and also the credit facilities are limited mainly because of lack of collateral (credit and insurance market failure). CF is an example of a institution that deals with many of these constraints in an integrated manner (Coulter, et al., 2000; Key and Runsten, 1999; Rehber, 1998).

Apart from these economic reasons there are several political reasons why CF is attractive to private companies. It allows the company not to invest too many resources in a country and therefore to avoid the risk of appropriation. CF, presented as a smallholder friendly scheme, can be good for the public image of a company and give the impression that it is progressive. This can be exploited by the company to encourage the Government, or even international aid agencies to provide credit for operating capital or for the rehabilitation of plantations (Baumann, 2000).

CF as a Response to Credit Market Failures

Non-traditional crops – like tobacco – purchased by agro-industrial processors are generally much more costly to produce per unit of land than traditional crops, and most growers require credit to finance their production. Hence the structure of the credit market and access to credit are important in CF. Agro-industrial processors are often well suited to provide loans to growers. Unlike the formal lending institutions, e.g. banks, agro-industrial processors can monitor and enforce contracts and do have lower default costs than banks. Processors can extract a grower's debt directly from the crop revenue before the grower receives his payment (Key and Runsten, 1999).

Often, growers have thin alternative markets and will be forced to sell to the firm. Unlike banks, processors can be assured that the credit is spent on production because the loans are usually given in kind and the firms often monitor the use of inputs. Low monitoring, enforcement and other transaction costs place firms in a position to compete favourably with formal and informal

lenders. In some cases firms get raw products from the farmers at below market prices in exchange for credit, thus presenting a big incentive for firms to contract than use the SM. To the extent that smaller, poorer farmers are willing to pay more for credit, firms will have an incentive to contract with them (Key and Runsten, 1999).

CF as a Response to Insurance Market Failures

Non-traditional crops tend to be riskier in terms of income than traditional crops. This stems from the associated higher market risks for non-traditional crops. Hence the insurance market is also important in CF. Yields tend to be more variable because of higher susceptibility of non-traditional crops to pest and climatologically related hazards. As a result prices tend to fluctuate a lot due to variability in supply. Frequently in developing countries, and especially for lower income producers, formal institutional strategies for smoothing consumption – crop insurance, formal credit markets, or commodity futures markets – are unavailable or have high associated transaction costs (Key and Runsten, 1999).

CF – as a response to insurance market failures – is in position to insure growers against price and yield fluctuations. Firms are able to diversify their production sources geographically, have access to inexpensive financial resources with which to smoother fluctuations in profit and with participation in production process allow them to provide insurance with low transaction costs and can avoid some of the moral hazard problems associated with crop insurance[27]. Thus imperfect insurance market provides an incentive for firms to contract or vertically integrate rather than use SM (Key and Runsten, 1999).

CF as a Response to Information Market Failures

Missing markets for information can slow adjustments on the part of growers and result in costly crop supply and quality shortfalls for firms that rely on SM for their product supply. With perfect information prices for products and factors should send signals about supply and demand, but prices may not efficiently transfer complex and rapidly changing information. Yet efficient production requires growers to have information about the optimal cultivation techniques and information about the needs of firms. On the other hand if firms were to contract labour they would need to supervise the work done. Models of labour supervision claim that hired workers offer an amount of effort that is a function of the amount of supervision applied (Key and

[27] For the firms, according to Mosely, P. and Krishnamurthy, R. in Mishra, P.K. (1996: 271), the insurance against the risks are categorized in four main types: i) "act of God"; ii) Destruction of specified assets; iii) Loan default; and iv) Production and income loss. In Eaton and Shepherd (2001: 79).

Runsten, 1999). In such an environment, VI that relies heavily on supervision to motivate labour will be relatively less efficient than cultivation by self-supervised farmers, *ceteris paribus*.

Firms can cope with missing markets for information, and efficiently communicate product and technology information to growers. Where production is information intensive and farmers lack resources to acquire the information, contracts can specify use of firm employed extension agents who both communicate the firm's needs, technical information and monitor the behaviour of growers. Large farmers have an advantage over small farmers with information gathering because of the fixed-cost nature of information acquiring. As a result small farmers are better off contracting, as a response to missing market for information, and because of high costs of supervision and moral hazard problems, firms are better off contracting farmers as well (Key and Runsten, 1999).

CF as a Response to Factor Market Failures

When markets for factors controlled by the household, such as family labour, land, management skills, or animal power – are missing or imperfect, growers will attempt to compensate by trading in the markets that do exist. Households with larger endowments of family labour will attempt to compensate for market failures in labour by renting in more land, or by producing more labour intensive crops. The land market is also riddled with imperfections especially in rural Africa. Firms have an incentive to contract with household with under-utilised resources such as family labour or land. For labour intensive crops – tobacco being one of them – firms have an incentive to contract with households with small land endowments and large families. Thus CF allows households that would otherwise under-utilise their resources to respond positively to the market imperfections in the factor markets (Key and Runsten, 1999).

CF as a Response to Product Market Failures

The agro-processing firms normally trade in crops for which there is a thin or missing local market, for example, cotton and tobacco in Mozambique. In order for the firm to meet its supply needs, they have to contract, if they cannot produce themselves. This creates a market for the product that would not have been traded locally. Given the underdeveloped product markets, firms may not be able to obtain sufficient quantities or timely delivery for their processing needs. Thus missing product market gives a firm an incentive to contract regardless of the scale of operation of the farmer (Key and Runsten, 1999).

3.2.3. Structure of Contract Farming

It is not easy to point out a standardized form for these coordination schemes due to the great variety, with their hybrid structure and multiple objectives that have been used in developing world. A simplified model, resulted from merging the models presented by Rehber (1998) and Eaton and Shepherd (2001) is discussed here for a standard (private company scheme) contract production form to have a fair and successful implementation of CF for both the agricultural sector and economy as whole (Figure 3.1). At first look it is obvious that both sides need each other in order to strike a bargain in the contractual relationship, which operates for their mutual benefits. Both should look at each other as partners who are working for them rather than rivals otherwise, this cooperation would be always a source of dispute and dissatisfaction. Therefore, as shown by the Figure 3.1, both should gather as requirements collaboration consciousness and additionally to that it is important to have established beforehand reputations for honesty and fair dealing.

On the grower's side, it's important for them to act in an organized manner, considering that the history of agricultural producers demonstrates that they have been seldom rewarded appropriately in the market place due to their weak market power relatively to other participants in the food industry. Recognition gained by organized groups is better as opposed to the lack of recognition accorded to unorganized farm producers (Anderson, 1994). And, as said by Scheid (1991) and Moore (1994), organizing a bargaining cooperative among farmers makes them rather powerful in a contracted relationship. Such an organization also could collaborate with processors, in negotiating regulations on imports and in other aspects, such as market development, political action, making adjustments to consumer demand, etc (Rehber, 1998).

Those bargaining organizations between growers and processors are to be organized on the national level. But in practice, the level of negotiation is an arguable problem. It could be said that, in general, the collaboration and negotiation between them might be better carried out in a decentralized way, at the firm basis. A nationwide farmer and food industry organization could act as an administrative organism, arbitrate and guaranteeing the application of private agreements. Experimentation and development of reference and agricultural techniques would probably remain the responsibility of the central body. According to Valceschini (1995), experience in France has shown that, between 1961 and 1990, a considerable shift had emerged to decentralize the contracted economy from the national level negotiations which are having difficulty reconciling industrial and marketing coordination (Rehber, 1998).

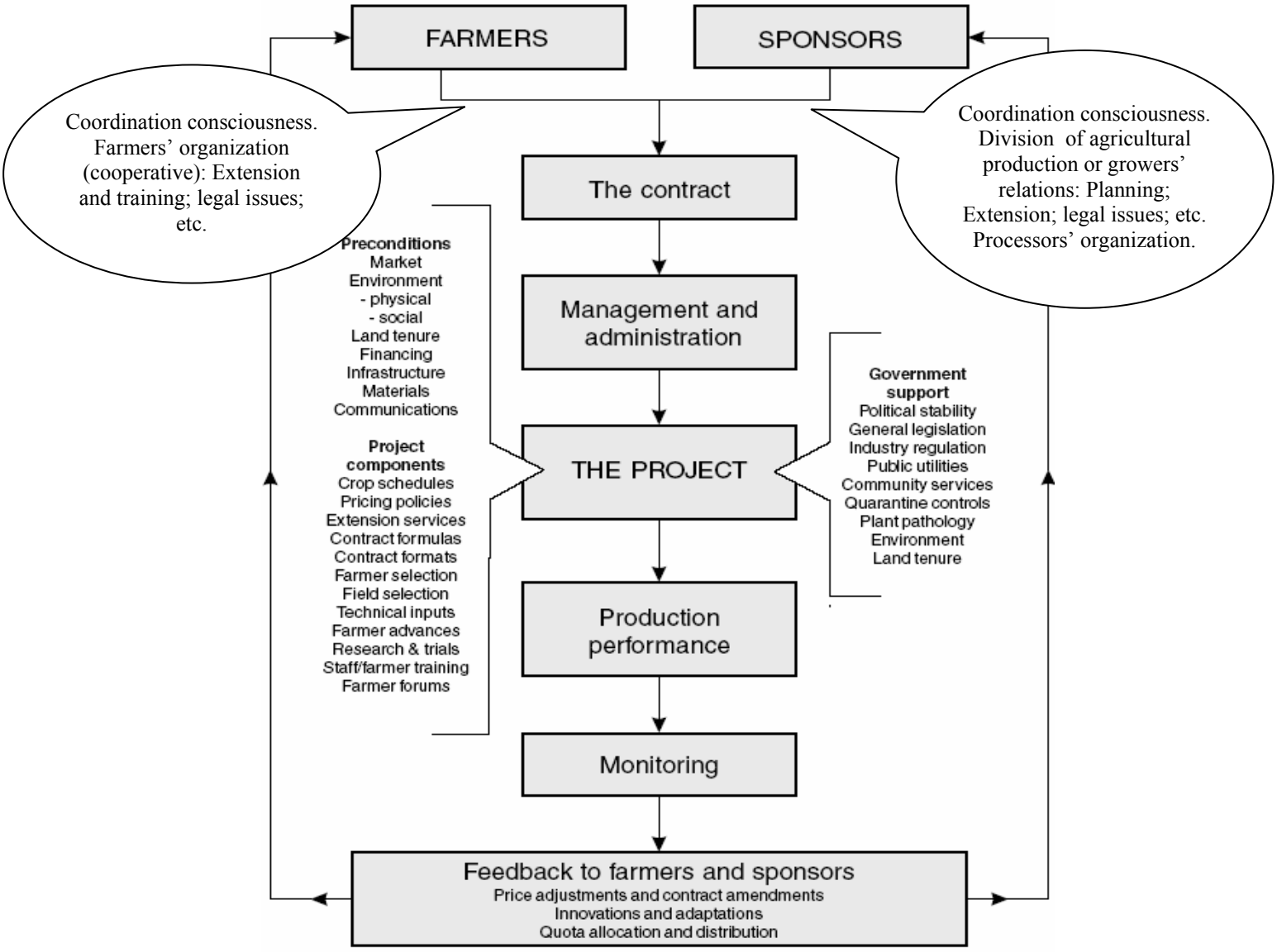


Figure 3.1 Structure of Contract Farming
Source: adapted from Eaton and Shepherd (2001) and Erkan Rehber (1998).

On the integrators side, in addition to the collaboration organizations with the growers and the shortcomings of that link, mentioned in the previous paragraph, they are the ones deciding on the most of the production and marketing practices and measures, therefore their activities efficiency directly affect the efficiency of CF. The first step in successful implementation is the organization of a sound organizational body. Contracts could vary from company to company, but all of them must have a special unit which is dealing with all contractual issues and is endowed with necessary persons and equipment. And its relationship to the other functions of the firm must be determined clearly (Brown and Deloitte&Touche, 1994). All these must be inserted in a sound socio-economic and legislative environment, which are on the governments hands to promote.

The governments' role is crucial in promoting a successful application. The first function might be legislative arrangements. In agriculture, with a tremendous variety of the production

enterprises, it is not possible to put out comprehensive contract models which have strict rules. Instead, government could determine a framework for a contract and enact some regulations to solve disputes and take part in arbitration to some extent. Besides this direct role of the government in contractual mechanisms, agricultural support and intervention policies which aimed, in general, to improve CF could be rather effective and functional. For instance, in the European Union (EU), according to the Regulation Commission, the production aid system is based on contracts between producers and processors and the particulars to be included in the contracts for the purposes of the aid system should be specified (by Anonymous 1984 in Rehber, 1998).

Tax policy is another aspect that must be considered to promote CF. CF is a way of recording systems of production, which creates a situation of reluctance to get on arrangements fearing more taxes. Thus adopting a tax policy which facilitates and remedies that situation could be recommended. Additionally agricultural crop insurance policy could be a considerable way to promote insurance against the risk[28] faced by farmers and, indirectly by firms. Turning to extension and training policies of the government, the CF has the potential to improve their functionality. Another point, which is the base of the discussion in this study, is that credit policies in agriculture also could be realized by contractual arrangements, especially by CF, that consider the contract itself as collateral.

As said above, the level of negotiation and cooperation is an arguable problem. Therefore an involvement of an independent organization to resolve disputes and disagreements[29] between firms and farmers, which are the major causes for failure in CF, might be a good idea, considering that going through the court systems creates long delays. Thus, according to Spolter (1992), arbitration and/or a conciliation system would be useful, by involving government and non-governmental organizations' representatives (Rehber, 1998). In arbitration, an arbitrator renders a decision and a third party imposes it, taking all the control away from the parties. But in a conciliation or mediation process, the parties retain control of the process and the outcome.

3.2.4. Success and failure determinants

When evaluating success and failure of CF applications and their outcomes and its different origins have to be taken into account. According to Watts (1994), on one side, in developed and developing countries, CF in one way, is seen to some extent as provider of a steady flow of the raw material to the marketing or processing industry with certain quality standards. This view is

[28] Specialization in production through contract farming might increase the profitability level, but it also involves higher risk for the farmers.
[29] This disputes and disagreements can be over quality standards, delays in delivery and payments and default on loans and others in the same framework.

also shared by Porter and Philips-Howard (1997). On the other side, in the less-developed world, it was initiated by complementing, occasionally competing with and partially replacing plantation and estate agriculture or by subsuming independent farmers and sometimes newly settled families under public or private auspices to produce a variety of products for domestic consumption and export[30] (Rehber, 1998).

In addition to individual project case studies there have been two important cross-country reviews. The first, co-directed by Michael Watts and Peter Little, specifically Watts, Little, Billings and Jaffee in 1988, and Little and Watts in 1994, incorporates field research in seven countries in East, West and Southern Africa. The second, by David Glover in 1989 and 1990, brings together research on 18 schemes in seven eastern and southern African countries. Both these studies and a number of individual project studies attempt to identify conditions under which CF can benefit rural economies and populations, though Glover is more positive, overall, in his perceptions of CF arrangements than are Little and Watts (Porter and Philips-Howard, 1997).

The nature of the crops and the technology in use for their production are the most crucial determinants of the success and failure of CF in practice. For instance basic grains that are not perishable and do not require strict quality or prompt harvesting and processing do not generally require contracts arrangements (Andrews, Hamilton and Looney, 1994). On the other hand, the perishable and bulkiness of some products requires concentrated production and careful scheduling and are generally subject to contractual relationships. For the commodities for which supplies of both inputs and outputs are inelastic and shifting, and cost is very high, such as broiler production, CF is rather successful (Rehber, 1998). The power interface between farmers and companies is another important determinant. It is particularly significant because exploitation in CF, as in other arenas, is ultimately based, above all, on an undefended and unequal distribution of property rights (Corbridge, 1993).

Minot (1993) points out that CF, in terms of structure, has a great variety: the form it takes and the attitudes and background of the growers are affected mainly by the availability of other alternatives and the peculiarities of the political, economic, and social circumstances at the local and national levels, along with the specialization of the product. Therefore, evaluation of using CF as a way of increasing agricultural productivity, improving marketing and fostering rural developments cannot be assessed independently from those factors mentioned above (Rehber, 1998). Then it can be said that the reasons behind success and failure of CF in developed, developing and less developed countries are so different depending on the related infrastructure.

[30] That explains how contractual relationships have been appearing as Outgrower schemes in developing and less developed countries while it was in the form of private ones mainly between an individual or a group of farmers and private companies in the developed world.

In the developed world, sophisticated market structure, high technology level, farming structure, and attitudes of the governments create a rather suitable environment for private contracting arrangements, which is increasing, depending on the product features. For instance, according to Kelley (1994), in U.S. agriculture from 1980 to 1990, the percentage of pigs produced under contract increased from 2% to 18%. In 1990 contract production accounted for 7% of food and feed grain production and 12% of cotton production. In the sectors where contract production began, more than 90% of broilers and 80% of processed vegetables are produced under contracts. The broiler industry in U.S., according to Vukina and Foster (1996), is almost entirely vertically coordinated as in almost all of the developed countries (Rehber, 1998).

In the EU the production aid system has been encouraging CF. This approach, of course, has a considerable role in the development of CF in the Union. For instance, Erkan, Akdemir and Koç (1993) have noticed an increase of the contractual arrangements in the Spanish food industry after joining the EU. In Spain the number of farmers involved in CF reached 77,000 in 1988 while it was only 28,000 in 1986. Zurek (1993) have reported that in German agriculture, CF and VI approaches can result in substantial advantages for cooperating farmers but do not automatically improve the competitive position of the parties involved. Grosskopf (1994) stated that in Germany, VI through contract production is already common in dairy, poultry and sugar sectors accounting for around 38% of agricultural production. Outside these sectors, however, only about 6% of output is produced under contract (Rehber, 1998).

CF is a continually evolving process and agricultural development is linked to overall development and affects the forms that CF takes in different area. This was salient in a study based on the data of the Agricultural Census of Italy, which shows that contract arrangements are closely associated with farming in the entire region and reflect the state and conditions of agricultural development in each of them (Pecci and Lipparini, 1993). In the improved feed sector, the spread of CF has accelerated a narrowing of the genetic base of Western agriculture which has accompanied the development and widespread use of new crop varieties (Burch and Rickson, 1990). Biotechnology companies are also expected to develop VI by responding to speciality markets and involvement in CF (Shimoda, 1994).

In the developing world available infrastructure needs intensive government involvement and also the financial support of domestic and foreign donor agencies and initiatives of national and multinational companies. In the recent two decades there has been a tendency for trans-national corporations to shift from land ownership to a contracting system. This system of coordination holds great potential for rural development if it can be integrated easily into the national economy. In such a structure, agricultural policies which are shaped by public institutions both at

the level of national governments and international organizations are shrinking in importance and are in the process of being replaced by unregulated, trans-national market forces (Nanda, 1995). Glover (1983) foresees that there is a possibility of exploitation as an unorganized mass of smallholders faces a single buyer. Political as well as economic factors are thus of crucial importance in determining the distribution of benefits resulting from CF (Rehber, 1998).

Latin America was not spared by this spreading of CF schemes. In Honduras, for example, bananas once cultivated on corporate plantations, are now grown by associate producers under contract. In Peru breweries that once bought barley on the world market are now supplied by contracts with a network of farmers. A study based on the experience of seven countries in East and South East Africa with CF and Outgrower schemes in Kenya, Tanzania, Zambia, Zimbabwe, Lesotho, Swaziland and Malawi, by Glover (1990), shows that in most cases, performance in delivering services and providing income increases to farmers has been quite good, although high management costs limit the extent to which this form of organization could be more widely applied. It was concluded that looser control and relying more on price incentives and farmer participation might lower overhead costs while developing management capacity among growers (Rehber, 1998).

The Kenyan experience has shown that CF has the potential to provide a Pareto-improving form of governance, and it can be used to increase the income available to the rural sector. It is a practice which may be engaged in for both efficiency and anticompetitive motives (Gross, 1994). Also in Kenya CF has, within smallholder tea production, changed family member relations and the role and stature of women and men in the family (Bulow and Sorensen, 1988). In Swaziland, the Fourth National Development Plan advocates the development of Outgrower schemes based on the example of Vuvulane Irrigated Farms as an alternative strategy for rural development (Levin, 1988). With reference to tobacco production in Sri Lanka, it is argued that CF can only contribute to meeting basic needs, if the income and employment it generates can be distributed with a measure of efficiency (Kirk, 1987).

In both Nigeria and South Africa was found that appropriate scheme staffing and a degree of decentralization in management structures to be a particularly critical element in forging good farmer-company relations for contract schemes are to work well: it is important not only that company do not cheat their small growers, but also that farmers are confident that they do not cheat (Porter and Philips-Howard, 1997). Moreover, communication between company and farmers, and consultation with farmers, is vital if perpetuation of top-down approaches - so often a major cause of failure on schemes - is to be avoided (Maloa and Nkosi, 1993). This cannot be achieved without the appointment of well trained liaison and extension officers, who speak local

languages, possess appropriate interpersonal skills and are preferably local *indigenas* (Porter and Philips-Howard, 1997).

It is clear that that small farmer who maintain alternative opportunities for production and income, *in addition* to their contracted obligations to the company, are in a much stronger position than those whose land area is devoted entirely to the contract crop, which have little opportunity to secure another income in case the company attempts to secure an agreement disadvantageous to the farmer, or where market prices suddenly collapse. Glover and Kusterer (1990) observed that the existence of alternatives is an important precondition for a CF situation that benefits small farmers. They suggest that companies may shelter producers from risk in the first few years of production, so that by the time the company starts to squeeze the growers they have committed a large portion of their resources to the crop. However, they also present evidence from outside Africa (Guatemalan vegetable production) that farmers may invest profits from the early phase when profits are high to diversify production so that they become less dependent on a single crop or buyer (Porter and Philips-Howard, 1997).

In the rapidly growing economies of Southern Asia, besides emergence of processing enterprises which meet the diversifying and growing domestic and international demand, CF systems are a feature of the rural growth process. A research study which was based on case studies of village level processing and marketing activities involving soybean, cassava and tobacco in Indonesia, by Kawagoe, von Broun and Kenedy (1994), illustrates that significant additional income and employment can accrue to farm producers from such agricultural marketing and processing activities at the village level (Rehber, 1998). India has become the second largest producer of fruit and vegetables in the world. When the facilities to improve this production potential are discussed, one of the measures suggested is CF (Bhatia, 1994).

Experiences in the same region of the world have shown variations. For example, Glover and Ghee (1992) study showed that the Malaysian schemes appear to be the most successful. They are long established and increase in size and number. The Indonesian schemes are also widespread and active. But Thailand's experience, according to Manarungsan and Suwangindar (1992) is quite the opposite. Attempts and efforts have failed in almost every case examined. Both farmers and firms enjoy greater flexibility, and more production, marketing and ensuring supply options if the farms are small and have diversified production activities. Of course, the failures in the related government policies also have negative impacts on CF. Perhaps the most important reason for the success of the Malaysian and Indonesian experiences, according to Ghee and Dorall (1992), is the strong and continuous support provided by government (Rehber, 1998).

According to Rehber (1989), one of the important reasons behind the failure of CF is the availability of other ways of vertical coordination and open market facilities. This is clearly experienced in the Turkish hop industry. In the hop market, there are three marketing alternatives that farmers are faced with. One private company is trying to grow some amount of raw material in its own plantation along with contractual relationships with the farmers. Another private company and the public monopoly are in the market only at harvesting season as buyers with an advance-paid price system. There is also a farmers' cooperative organization as a third alternative. In such a structure, despite the favourable offers, according to Rehber (1997), the private company could not succeed in increasing the number of the contracted farmers and its market share over 60% (Rehber, 1998).

4. Research Methodology

If it is true that every theory must be based upon observed facts, it is equally true that facts cannot be observed without the guidance of some theory. Without such guidance, our facts would be desultory and fruitless; we could not retain them: for the most part we could not even perceive them.

— Auguste Comte ("The Positive Philosophy", 1853)

Questions of methodology are all about the validity, using the correct measures for the concepts being studied, and reliability, stability, accuracy and precision of measurement, of the data collected. Therefore, better understanding of methodological issues may encourage improved research practices by fostering consistency between the underlying assumptions, theories and knowledge production activities of management and organizational researchers.

But it is also important to consider the fact that economics deals with the interrelations of human beings, and that the investigator is himself part of the subject matter being investigated in a more intimate sense than in the physical sciences, raises special difficulties in achieving objectivity at the same time that it provides the social scientist with a class of data not available to the physical scientist.

In this chapter, the methodology adopted for this research is described, including a description of the research setting, data collection methods and analysis techniques. It is structured as follows. In section 4.1, personal motivation in the study is presented. In section 4.2, the research approach is discussed, including details about each approach used in the study. In section 4.3, data

collection sources and techniques used for data collection are described. It also includes details of the analysis process.

4.1. Motivation

Firstly, it's important to commend all involved in this program, which is very a vital instrument for students who have the desire to study and impact and assist that development of their country but do not have access to the financial means to accomplish this. I came across the *Environment and Development Economics Programme* through Andrea Shindiapin, a member of the Eduardo Mondlane University (UEM), Maputo, while was writing the dissertation for Honours degree in Business Management, at the Faculty of Economics at UEM. Opportunities of this nature are uncommon for individuals at an early stage of their professional development.

From August 2002 to June 2003, employed as a trainee economic consultant in a private consultancy company in Mozambique, achieved an unique opportunity to practically apply the skills acquired till that date in a broad range of projects, for example surveys on barriers to exportation in Mozambique, a cost evaluation of Maputo's Central Hospital and a survey of the Mozambican business environment. Through this experience a great interest in development economics was cultivated and an intention to proceed with postgraduate studies and research on development economics, focussing on the area of finance, which reflects the interest area.

The practical experience gained has served to reinforce the desire and intention to continue with postgraduate studies and has also improved the understanding of the significant role played by economists and managers in developing countries. As a student and an assistant teacher within the Faculty of Economics at UEM during the first semester of 2003, the main principle instructed and learned was one can never say *I've learned enough*, because economies are a dynamic system, being in a constant state of change.

4.2. Research Approach

In order to bring up the theoretical base of the contractual relationship and what so far have been written about it and empirical evidence, to back the theoretical aspects, the research approach was based on the following founding principles: i) A triangulation of positivism, post positivism and logical empiricism; ii) Econometrics; and iii) Case study method. These are now discussed.

4.2.1. Positivist, post positivist and logical empiricist approach

Positivism is oriented to testing and confirmation of general theories which take the form of well validated propositions which specify relations, often causal, among well defined and quantitatively measured variables. It is effective for theory testing but it precludes theory development and discovery because positivist methods are inherently oriented to testing pre-established hypotheses and propositions. Positivists seek rigor using statistical criteria and conceptions of reliability and validity to evaluate the quality of quantitative findings. Sample size, common methods bias and sampling error are common concerns (Gephart, 1999).

The problem with the positivism is that the world might not be readily apprehended and that variable relations or facts might be only probabilistic, not deterministic, thus the positivist focus on experimental and quantitative methods used to test and verify hypotheses have been complemented to some extent by an interest in using qualitative methods to gather broader information outside of readily measured variables. This view is consistent with the post positivism, which also assumes that an objective world exists, being this way an evolution of the positivism (Gephart, 1999).

The empirical work is also informed by logical empiricism, developed by Carnap (1936), a more moderate version of positivistic approach, which assumes, as the positivistic, an objective world and is concerned in disclosing truth and facts using experimental or survey methods, focusing on formal propositions, quantifiable measures of variables, hypotheses testing, and statistical generalizations from a sample where the phenomenon is studied to a larger population (Bharadwaj, 2000; Gephart, 1999; Orlikowski and Baroudi, 1991). The only difference between the two of them is that instead of the verifiability criterion, the logical empiricism, uses a more liberal testability criterion, replacing the notion of verifiability with the notion of *gradually increasing confirmation* (Bharadwaj, 2000).

This triangulated approach adopted drew upon both quantitative and qualitative methods of data collection in order to fill the gaps of one another such that the reliability and validity should not be questioned. More specifically, the qualitative methods used in the study included semi-structured informal interviews, informal meetings, and secondary data collection including of forms, manuals, reports and other individualities datasets. As for the quantitative methods, the following section specifically addresses it.

4.2.2. Econometric approach

Positivism assumes an objective world which scientific methods can more or less readily represent and measure, and it seeks to predict and explain causal relations among key variables (Gephart, 1999). Here the role of Econometrics becomes important, since it is, at a broad level, the science and art of using economic theory and statistical techniques to analyze economic data (Stock and Watson, 2003). It helps in decision making process in economics, when it involves understanding relationships among variables in the world around us, just as in the case of this study. Here the decision problem is whether the CF scheme can be considered as an alternative, to the other credit sources, in the sense that can be used in coordination to overcoming its market failure problems.

Specifically the econometric instruments to be used here are characterized as follows. In terms of the econometric model, the maximum likelihood Probit and Logit models are the ones mostly relied on to assess the type of decision problem stated. Probit regression is nonlinear regression model specifically designed for binary dependent variables. It uses the standard normal cumulative probability distribution function. Logit regression is, also as Probit, a nonlinear regression model specifically designed for binary dependent variables, with the difference of using the logistic cumulative probability distribution function (Stock and Watson, 2003). The previous one, Logit, is the one that will be used as the main econometric tool for the assessment of the main hypothesis. Additionally to this data validity, normality and heteroskedasticity will be assessed in order to guarantee data and hypothesis testing robustness.

The use of probabilistic models is justified by the main idea to be tested, whether higher is the probability of the success of the CF' credit scheme relatively to other sources. Moreover, the econometric approach allowed to determine the importance of the, across households under vertical coordination with the two companies, DIMMON and MLT, in four districts of Tete Province, the conditions of land ownership, inputs and utensils endowments, education, household income and other factors[31].

4.2.3. Case study approach

Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. Robert K. Yin (1984) defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when

[31] The whole variables list used can be seen in the Table B1, under the Appendix B.

the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Soy, 1996).

The case study research method was opted to bring us to an understanding of a complex issue or CF' credit scheme and extend the experience through explaining and building upon what so far is know about CF scheme. Additionally it was also used as a way to provide a basis to apply solutions to the situation of the credit constraint the smallholders face. The qualitative and quantitative nature of the data, in addition to the need to explore a wider range of variables that influence the structure and performance of the CF scheme, strengthen the case study method's odds on being used.

4.3. Research setting and fieldwork

A major trend towards the role of the micro financial institutions has recently emerged in Mozambique. Additionally questions about what kind of approach toward the agricultural sector development is raised. Some argue the industrialization is the only way to boost the agricultural sector. Others say that efforts must be taken in order to increase the productivity ratios without entering into complicated technologies transfer to the smallholders. All sectors have been targeted by this movement. The credit sector was the not left outside, being the main *clutch* no matter what the outcome of the movement.

The Principal-Agent (PA) model was the framework of all the study, under the game theory and informational asymmetries. The use of the model was motivated by the existence of a contractual relationship between the grower and the contractor, where both have right and obligations towards each other. Also the informational asymmetries, for example, of the grower not exerting the effort desired by the contractor or the contractor defaulting on the obligation of buying the grower's *product*, motivated the use of the PA framework.

4.3.1. Data collection

Fieldwork was carried out during the period from January to March 2005. Data were collected through informal interviews and informal meetings with financial and agricultural sector personnel[32]. The personnel met ranged from economists, the head of some micro-financial institutions, of the agro-industrial programs (the DIMON – Tabacos de Tete and Mozambique Leaf Tobacco (MLT)), and researchers on the relevant area. The interviews or conversations

[32] Informal interviews were discussions carried out in unplanned and chance meetings with relevant personnel. Informal meetings were also unplanned discussions with a group of them.

were informal and semi-structured, due to the fact of being located in rural areas, near to the smallholders, and continuously working. In addition, several informal conversations and discussions also took place with senior staff at the administrative and operational levels.

Data was also gathered through formal arrangement with the relevant institutions, namely BoM, DIMON, MLT and CPI. In the case of the BoM the data was at macro level, which allowed the sectored distribution of the credit and of the credit by finality (crops). As for the DIMON and MLT, being the target institutions, from quantitative to qualitative information was collected, as cross-sectional data about the household or smallholders under the CF scheme with this institution, from the MA[33].

The cross-sectional data consist of information on the smallholders' characteristics, from their family members to their farming activity' information, under vertical coordination with DIMMON and MLT companies in Tete province, specifically in Chifunde district for the first company, and Macanga, Angónia and Marávia districts for the second company. The data was a result of a survey conducted by the Gabinete de promoção do sector comercial agrícola (Cabinet for commercial agricultures' promotion – GPSCA), working under the Department of Policy Analysis (DAP) of the Economics Directorate (DE) in the MA, to the family sector of the Zambezy Valley, specifically in Tete and Sofala provinces, related to the cotton and tobacco crops.

That survey was conducted in two periods, firstly in March 2004 and secondly in August 2004. Although the data had limitations primarily because of the incomplete nature of the financial records of the smallholders, secondly to the limited number of crop coverage, and thirdly the consideration of only one province, Tete, for the assessment proposed, certain estimates were established in line with general accounting practices and the given information by the companies, also a yearly nationwide conducted survey by MA, called TIA (National agricultural survey) of 2003, was used.

Developing an inventory of the current and planned agro-industrial investments in Mozambique and placing them within the typology of organizational forms under the vertical coordination between the agribusiness firms and the growers was also done. To achieve that and create the basis for more in-depth work on specific businesses, detailed secondary data were collected on a universe of over 300 rural based projects approved by the CPI between 1985 and mid-2001. The database and the analysis only include projects that are owned by the private sector. Therefore,

[33] The GPSCA, MA, realized a study of impact assessment for cotton and tobacco sector in Tete and Manica, from which the data respective to Tete was friendly provided.

given the nature of their ownership, CI projects are not included. This was also aided by Rui Benfica, a good friend and economist, which also had this data.

4.3.2. Data analysis

All the data was captured in Microsoft Excel, SPSS for Windows and STATA SE 8.2. The analysis of the data was aided, also, by the Microsoft Excel, SPSS for Windows and STATA SE 8.2. The assessment of whether the CF credit scheme can be considered as an alternative approach relatively to other credit sources, in order to get a higher outreach and *real* effects on the real economy, was realized with the use of econometric analysis tools, specifically the Logit model and the Linear regression model.

Descriptive statistics and means test

Descriptive statistics was used to give a description of the tobacco farmers of the studied districts, and to have an idea on their performance. Also means tests, such as independent samples *t*-tests, including student *t*-test and one-way analysis of variance were employed in the analysis. This was mainly used to compare statistics between the farmers under the CF' credit scheme and the ones that are not under that scheme. Thus an inference into the welfare impact of CF' credit scheme was made possible with some of these tests.

The alternative hypothesis testing tool was used to investigate if there were significant differences, in terms of ease the credit constraints problems, between the smallholders under the CF' credit scheme and the other credit sources scheme, in the case of the tobacco growing households of Tete province.

$$\textit{Null Hypothesis:} \qquad \mu_{CF} - \mu_{FS} = 0$$

$$\textit{Alternative Hypothesis:} \qquad \mu_{CF} - \mu_{FS} \neq 0$$

Where μ_{CF} - mean income for smallholders under CF scheme

μ_{FS} - mean income for smallholder under the other credit sources (government, formal financial sector, NGOs and associations), including the ones without any source.

Since the assessment involves comparing means from different randomly selected samples, implying that they are independent random variables, the distribution of the null hypothesis will be the following

$$N\left[\mu_{CF}, \sigma^2_{CF}\right]$$

The decision criterion used is that when the computed *t*-value is positively larger than the tabulated t-statistic, corresponding to the significance level considered, the null hypothesis is rejected. To compound the *t*-statistic the following equation was used:

$$t = \frac{\bar{Y} - \mu_{CF}}{SE(\bar{Y})}$$

Econometric estimations

Based on the data available and the nature of investigation, the maximum likelihood Logit model were found to best address the issue – is the CF' credit scheme a relevant rural development tool in comparison to other credit sources? The dependent variable in this analysis is related to the dichotomous (dummy) variable of credit source, where 1 = farmers under CF scheme, and 0 = farmers under other credit sources. The Logit function is specified as:

$$\text{Logit Model - } p = \Pr(Y = 1|X) = 1/\left(1 + e^{-(\alpha_i + \overline{\beta X}_i)}\right)$$

Where e - base of natural logarithms;

X_i - vector of independent variables;

$\alpha \,\&\, \beta$ - model coefficients for the independent variables.

The approach taken for the current study is based on the odds ratio, which estimates the change in the ln odds $(\beta\ value)$ for a unit change in the independent variable. Alternatively, we can say that e^{β} is the odds ratio for one unit change in the independent variable. Thus cross sectional regression to be estimated will, in general look like the following (considering all the variables involved, with additional commands used in STATA for the odds ratio (or) and for the robustness in the errors (robust)):

$$\ln\left(\frac{\Pr(hh\_creds = 1 \mid f(X_i))}{1 - \Pr(hh\_creds = 1 \mid f(X_i))}\right) = f(X_i)$$

Where $f(X_i)$ refers to the linear function of the variables grouped in: i) credit risk indicators, ii) household asset endowment, iii) household's head education, iv) household's head demographic characteristics, v) households activities, vi) tobacco related indicators, vii) the CF contractor, and viii) the households location. The objective of this analysis is to test whether CF' credit scheme is more likely to provide a better possibility or higher accessibility probability compared to the other available sources of credit, when the following aspects are considered.

The coefficients estimated from the regression above were odds ratio coefficients, which helped overcome the problem faced with the normal Logit model, where the coefficients are difficult to

interpret and are the natural logarithm of an odds ratio. An odds ratio below 1 indicates a decrease (that is, a unit change in the independent variable is associated with a decrease in the odds of the dependent being 1 in binomial logistic regression, or being the highest value in the case of multinomial logistic regression). An odds ratio above 1 indicates an increase (that is, a unit change in the independent variable is associated with an increase in the odds that the dependent equals 1 in binomial logistic regression, or being the highest value in the case of multinomial logistic regression). An odds ratio of 1.0 indicates the two variables are statistically independent.

The econometric linear regression model used for estimating the factors influencing total income per household member in order to assess the second hypothesis proposed in the introduction chapter is given as follows:

$$Y_i = \alpha_i + \overline{\beta X}_i + \varepsilon_i$$

Where Y_i - dependent variable;

X_i - vector of independent variables, grouped as the previous model;

ε_i - error (disturbance) term.

5. Case Description of Mozambique – Tobacco Agro-industry's Credit Farming's credit scheme in Tete

The test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have too little.

— Franklin Delano Roosevelt

In this chapter a presentation of the empirical set of the study. Namely it draws upon the presentation of the results from the data collection and analysis of the hypothesis stated in the introduction chapter. It provides firstly a characterization of the setting to which the data is referred to, specifically the Tete province and the tobacco industry. Then follows characterization of the data collected, based on the sample mean test and other descriptive statistics instruments. The following section shows the results from the analysis or assessment of the hypothesis. And the last section is reserved for some thoughts about the results for the hypothesis assessment.

5.1. Background

In terms of main characteristics of CF type of coordination in Mozambique, there is the following: i) 22.59% of the investment in the agro-industrial sector so far realized were in CF schemes; ii) The FDI portion (21.62%) of the investment is ranked in the second position, after the Loan; iii) 41.45% of the investment is oriented for the foreign market only; iv) Cotton, tobacco, tea oilseeds and maize production use to some extent CF scheme; v) Cotton and tobacco are the ones with higher level of investment using CF scheme; and vi) CF is more predominant in the northern part of Mozambique, specifically in Cabo Delgado and Zambézia[34].

Concession-based tobacco production is a growth industry in Mozambique. In the 2002/03 season, Mozambique's tobacco exports reached USD 30 million. The supply of input credit by tobacco companies is a key feature in this industry, and in practice all tobacco farmers receive input loans from the firms. In the same season, some 120 000 smallholders participated in tobacco production in Mozambique. The average area of tobacco per smallholder is estimated at 0.5 hectares (Ruotsi, 2003).

MA estimates that typical amounts of seasonal credit offered per smallholder vary between MZM 500 000 and MZM 1 000 000, or about USD 24 and USD 48. This would mean that the total annual disbursement of company credit to the sector would be around USD 2.5–5.0 million. As many new tobacco projects with ambitious production plans are in the pipeline, the input credit disbursements are likely to increase significantly in the coming seasons. In tobacco, some 100 000 smallholder were estimated to receive company credit to a total annual value of USD 2.5-5.0 million. Outside the cotton and tobacco concessions, experiments with CF and company credit delivery have been of a very limited scale only (Ruotsi, 2003).

The Tete province contributes to the GDP in between 23% and 30%, most of which produced by family sector, being one of the provinces with agriculture potential. For example in 1999/2000 campaign Tete contributed in 13.3% of the nation maize production, of which 99% came from the family sector. In spite of its importance, especially of the family and the micro-company dimension, they have been facing serious constraints on bank credit due to risk inherent to the activity itself and lack of real guarantees (ACP, 2003; DNCI, 1999)

Tete's financial sector is packed in to four banks, BIM, Banco Austral, BSTM and BCIF; Three micro-financial institutions (CMME, AMODER and FOS – Chitima); One Public fund (FFPI). The banks activity is more concentrated on savings services and little credit is destined to the informal commerce. The Public fund concentrates on micro and small businesses of industrial,

[34] For broader and detailed characterization of the Agro-industrial investments see the appendix A2.

fishery and commerce (including agricultural commerce) sectors. The micro-financial institutions have as active loans about USD 137,718.85, and about 1,754 clients. The group lending systems is the most common one, besides the individual lending practiced only by the AMODER. On average the loans range about USD 30 to USD 300 (ACP, 2003).

Various companies operate CF schemes of tobacco in Mozambique and many are expanding their cultivation area. Their supplied items offered on credit commonly include tobacco seeds or seedlings, a selection of required fertilisers, herbicides and pesticides, equipment for cultivation, material to construct farm-level curing barns, bags for harvest, transport of crop to buying centres and extension services (Ruotsi, 2003). The ones that matters for the study, as already mentioned are MLT and DIMMON. Their contribution for the national production of tobacco, in terms of volume, was about 27,130.00 tons of Burley type of tobacco, 1,740.00 of Flue type and 5,000.00 of Fired Cured type during the 2003/4 season, all amounting about 68.39% of the overall tobacco production.

5.2. Sample characterization

Descriptive statistics for both groups of under and not under the CF scheme households are shown in the Table B.2. The results from the means test suggest that, in terms of credit risk indicators there is a significant strong position for the ones under the CF scheme. Under the CF scheme the risk of the farming activity is highly inferior to the one outside. This may be related to the crop diversification and food insecurity issues for the ones not under the CF scheme. Another important indicator is the total income per household member, which suggests that the household have better perspectives under the CF scheme than not.

On one hand, concerning the household asset endowment we see that the there is not a significant difference in terms of the labour endowment needed for both samples. On the other, concerning the level of education of the household's head, we see that higher is the probability for the less educated to be outside the CF scheme. But one important point to see is that as the head becomes more educated the probability of being under the CF scheme also declines. This might be related to the fact that with more knowledge they begin a business outside the farming sector.

And when analysed for their demographic characteristics, the fact that the household head is male or female has not that high impact, though higher probability is attributed for males. As they grow older, there is a transition, from their second twenties to above their third twenties, of the probability of being in the CF scheme to the outsider. Additionally, as expected, the higher

probabilities of being in farming activity better chances are in CF scheme. The contrast found was that significantly higher portion of land is dedicated to the food crops under the CF scheme.

As for the tobacco related indicators, not much can be said due to the methodoly adopted to fill the missing values in the dataset, the mean value estimation. Also for the companies dummy litlle can be said, because they are already involved in the CF scheme. When looking at the localization aspects, it possible to see that the district of Chifunde and Macanga have higher prospects compared to Angónia and Marávia. The surprising aspect here is that Angónia is considered to be one of the best agricultural sites of the country, and has higher prospects for family farming than commercial farming.

5.3. Empirical assessment

5.3.1. H_1 assessment – The CF schemes can be considered as an alternative way to reach the rural growers, in terms of financial system's credit channel

Regression findings

The results for the maximum likelihood Logit regressions can be seen on the Table B.3. The analysis starts with regression of the odds ratio of being under CF's credit scheme with the credit risk indicators (1). The model is significantly explanatory of 28.69% of the variances of the credit source issue, though only farming activity risk effects different from zero. Higher risk of farming activity increases the odds ratio of credit funding from an agro-processing relative to the other credit sources in 1.769889 points per increment (about 76.99%[35]), *ceteris paribus*. The assetarea ratio plays a major role in influencing the odds ratio of the credit source, in about 239.40% increase, though it is not statistically significant, *ceteris paribus*.

When controlled for the household's assets endowment (2), the explanatory level of the model improves significantly to 42.32% and, as expected the ratio of assetarea's influence drops in about 106 percentage points (pp). On the other hand the farming activity risk, continuing significant, increases its influence to 92.91% the odds ratio of getting credit from the processing companies relative to the other sources, *ceteris paribus*. The interesting thing is that the coefficient of income per household member does not suffer change. It keeps increasing the odds ratio in about 171.80%, *ceteris paribus*. From the assets endowment indicators, only the hand tools indicator influences significantly the odds ration positively in 3.723634 times per unit of change, *ceteris paribus*.

[35] The percentage is calculated as follows: $\left(e^{\beta}-1\right)*100$. The same formula was used for the other percentages reported in this section.

Next the households' head educational and demographical characteristics are considered (3), which resulted on the income per member becoming significantly influential, though the level did not change. The owned area also became influential (about 2.238487 times per unit change), increasing the odds ratio of getting the credit from the processing companies relative to the other source the higher is the owned area, *ceteris paribus*. The odds ratio of being able to get credit relative to other sources of household's head being man compared to woman, increases in about 23.14318 times, *ceteris paribus*. There is also, not that high, improvement on the explanation of the variations between the credit being given either by the processing companies or the other sources considered.

After considering for the household's activities (4) the farming risk looses its significance. The proportions reserved, either for food crops or cash crops, becomes highly influential in the decision about the credit source. The higher the proportion is dedicated for both types of crops better are the odds ratio of being in the processing companies' credit schemes relative to the other credit providers. The number of fields, in exchange of the area, becomes significantly influential, in about 6.5660 times per unit change, in the likelihood of the odds ratio for the credit source, *ceteris paribus*. Both, the hand tools and the income per member, does not suffer significant changes. As for the assetarea indicator, increases the odds ratio in 112.48% for higher assets over area ratio, *ceteris paribus*. Significantly higher is the explanatory power of the model. A peculiar, as expected, fact comes out from this regression. The impact of whether the household grows or not a cash crop is higher than whether they grow or not food crop.

Introducing the tobacco related variables (5) the income per member looses his significance to the value of the given credit, which influences the dependent variable in 2.7180 times per unit change of the credit, *ceteris paribus*. The model continues to be significantly explanatory with a slight improvement to 59.78% of the variations of the dependent variable being explained by the regresses. The influence of the assetarea indicator increases to 2.107706, while the influence of the fields owned declines to 5.965543, *ceteris paribus*.

When controlled for the MLT company (6), the value of the given credit's impact on the dependent variable does not change. And the characteristic of producing food crops looses their significance and additionally both, the food crop and cash crop proportion indicator's influence drops drastically. The model's explanatory power improves slightly, maintaining its significance. The odds ratio of getting credit from a agro processing company relative to other credit sources, increases by 37.35998 times for MLT schemes compared to the not being under this processor, *ceteris paribus*. The indicator of owned fields and hand tools see their impact on the dependent

variable reduce slightly. As for the asset over area indicator, increases its influence in about 2.2 pp.

On the other hand when the DIMMON company is considered (7); the improvement of the explanatory power of the model improves slightly less compared to the MLT one. And on the contrary to the MLT one, here none of the variables (considered in the model 5) loosed their statistical significance, and their influence level (the coefficient) also maintained in general.

Due to collinearity issues, the DIMMON company was not further considered in the analysis, as well as its localization district, Chifunde. This way when controlled for the location (8), the model of the MLT (6) improves significantly, to 66.61%. In addition the asset over area and owned fields become less statistically significant, in exchange of the second grid primary school, advanced ages (20 to forward), and the dummies for Angónia and Marávia districts. The MLT influence climbs when the districts where they operate are considered. The Angónia district influences in increasing the odds ratio in 0.6722% for the ones in that district compared to other districts, *ceteris paribus*. As for the Marávia district, it influence in 1.005871 times the odds ration when compared to the other districts.

Hypothesis assessment

The decision about whether the CF's credit scheme is better or not, under the tobacco farming can't be generalized only by the results from this study. But important insights can be collected here. There is a significant probability for the CF schemes becoming the propulsion of the rural financial market through its credit schemes.

From the results it's possible to see that the location (district), the land proportion reserved for each type of crop, the hand tools endowment, level of credit in terms of value are important determinants for the success of the CF's credit scheme as alternative source of credit for the tobacco growers of Tete province.

5.3.2. H_2 assessment – Growers socio-economic characteristics, explain why they are better off under the CF than the traditional credit system

Regression findings

The results for the linear regressions related to the determinants of the income per member of the household can be seen on the Table B.4. The analysis is divided into two regressions, according to the location of the processing companies. The interest here is to see, separately for each

company's area, if the credit scheme controlled for the households' characteristics has a considerable impact on the income per household member.

The first one (1) is related to the MLT's scheme area. There it is possible to see that only the (normalized) household size and their activity characteristics, whether are in farming or outside farming, have statistically significant influence on the income per member, of -764.7078, 505.5577 and 649.3870 respectively. The credit source dummy has a really high negative coefficient of 1,085.8160, though statistically not significant. And the model it self is not statistically significant, since Prob>F=0.1507.

When looking at the area covered by DIMMON (2), the same inference can be made, only that there is higher influence from the same variables mentioned for (1). Specifically the household size costs to income per member 777.5770 per additional member. Each prospect of income outside the farming increases the income per member in 655.4203. And the farming activity contributes in about 510.0466 to the income per member. Here, as in the previous model (1), the credit source dummy has a really high negative coefficient, meaning that higher level of credit means reducing 1093.5310 in the income per member level, though statistically not significant.

Hypothesis assessment

The regressions showed that there is a relation between the income per member of the household and their characteristic, but it is not as strong to support the idea that their characteristics explain why they are better off under the CF scheme. But it also does not reject the idea that growers characteristics, like the household size, their core activities, whether is farming or/and outside farming do show some important effects on their well being.

5.4. Assessment discussion

The linkage between the agricultural sector and the agro-processing industry varies from contract based coordination to an ownership and associations. And depending on that structure different types of effects can emerge. If agriculture requires significant external inputs, growth in backward production linkage is expected. If output from agriculture requires processing before it can be sold or if there is significant value added by processing, forward production linkages are to be expected. If there is sufficient growth in the agricultural sector to induce rural income growth, expenditure linkages will induce growth in consumption and possibly in investment. This is, multiple and diverse linkages can be expected from a dynamic agricultural sector.

On the other hand, the funding of the rural areas determines the development of the rural economy, particularly the production and marketing components of agriculture sector. Here, the complexity of the credit problem is determined by multiple factors which transpose the financial markets borders. The identified constraints can't be overcome by injection of financial resources only. On the supply side the main drawbacks are the debility of the few institutions operating in the rural areas and inexistence of the formal sector which limits their capacity in identifying and selection borrowers. On the demand side the lack of adequate management capability of the commercial agents in order to access the credit.

But then again we can ask why is it profitable for firms to issue smallholder credit in areas where financial institutions are unable to do it on a sustainable basis? Simmons (2003) lists a number of advantages the marketing firms have over financial institutions in the operations. Through contracts with farmers, the company can monitor input use and establish a degree of control over crop management decisions that might jeopardize repayment. Firms can deduct repayments direct from crop payments, without having to rely on a third party to do this. They can also make future farming contracts depend on meeting repayment clauses of the current contract, a potentially strong repayment incentive in areas where no other source of input credit exists (Ruotsi, 2003).

Additionally large marketing firms also can source funds from the formal financial sector, an advantage many small rural finance institutions do not have. But the core difference is considered by most writers to be that the companies hardly ever aim to make profit on the delivery of small credits but do it from the related produce transactions, and in this manner can bear the high transaction costs typical to smallholder credit. Adams et al (1992) summarizes these views: "I have yet to find a merchant who would not prefer cash transactions over those involving credit. This suggests to me that most merchants view lending as a necessary nuisance rather than as a way to sweat additional profits out of their clients". Thus input credit is in most cases used to secure the volume and/or improve the quality of the produce the marketing company can buy, as a means to higher turnovers and profits from the marketing of farmers' agricultural products (Ruotsi, 2003) .

The CF scheme can be used as alternative way of providing credit to the smallholder in the case for missing financial formal markets. This way it can, temporarily, fulfil the missing links and allow the improvement of the linkages and the process of the development of the formal financial sector in rural areas. Though they can provide the credit, some additional aspects have to be taken in account for there to be a profitable arrangement between both, the framer and the company. As seen from the case study sample, there is a strong rationality for the companies to

take into consideration, above the credit risk indicators, farming activity characteristics, in addition to the location and the hand tools owned by the household when considering the CF's credit scheme. Here the credit given also plays an important role in the decision process of the companies' relation with the smallholder.

Another important group of issues that has to be considered are related to the problem of the agriculture development is not limited only to the credit issue. There are also other aspects to it like the inputs and technology availability, access to markets, transportation and stocking facilities are few among the many existents. The CF scheme has the potential to overcome this issues helping in the improvement of the agricultural productivity and household incomes. It also can *insure* against the market failures.

But at the same time it is also clear that company credit is not, and does not aim to be, a substitute for the operations of the financial institutions. The range of financial services provided by the marketing companies is very narrow, consisting in most cases only of small in-kind seasonal loans. Banks, MFIs, SACCOs and other financial institutions can offer a more diverse range of services, including savings, investment loans and money transfers, and are expected to do it in a transparent manner under relevant supervision arrangements. Therefore, patient and long-term development of rural financial institutions and services remains crucial for the progress of rural economies in Africa (Ruotsi, 2003).

6. Concluding remarks

People are idiots. Everyone is idiot (…). The only difference among us is that we're idiots about different things different times. (…). I don't know why the economy works, but I'm sure it isn't because brilliant people are managing it. My guess is that if you sum up all the absurd activities of management, the idiocies somehow cancel out, thus producing cool things that you want to buy, such as Nerf balls and Snapple. Add up the law of supply and demand to the mix and you've pretty much described the whole theory of economics.

— Scott Adams[36]

The operations and traditional production technology of the typical family farm, and its associated credit needs, are too small to warrant the economic extension of the formal credit system. This is due to: i) Agriculture's high risk; ii) High costs associated with the selection and monitoring the credit beneficiaries of rural areas; iii) Risks associated with the low level of schooling and knowledge of business modern practices of the rural agents; iv) Lack of real guarantees; v) Weakness of the existent legal enforcement system; iv) High market interest rate and collateral requirements not adequate to them; vi) Risk aversion behaviour of the banking sector; and vii) Lack of *political* will on investing in agriculture from the banks part. Therefore, in short term can not be expected that the commercial banks would consider in their strategies of market expansion the agricultural commerce.

Moreover, family farms typically do not generate sufficient marketable surplus to justify or service commercial bank credit. Thus the family sector production might be best fostered by:

i) The credit demand being met trough extension of the use of the informal credit system and by trading system;

ii) Facilitation by the banking sector the extension of credit to retailers and purchasers of family sector output and on-lending through these agents to the family producer;

iii) Introduction of innovative lending instruments should accompany, not substitute, the enhancement of the bank's networks outside the cities.

Instruments could be introduced to finance the start-up costs of production activities of small entrepreneurs. One instance should be the introduction of small loans to family producers in cities and green zones to start-up production activities, using as a guarantee the wage of one other member of the household. These could reach potential borrowers that currently have no access to the formal banking sector either for lack of collateral or *co-participation capital*.

[36] In Adams (2000).

Another important measure could be that in rural areas not served by banks, traders should be allowed to borrow the finance the extension of credit for production inputs to small agricultural producers, who sell their crops to, and often also purchase inputs and consumer goods from, large traders. This type of arrangements, are already informally used in some areas in form of delayed payment for inputs which are purchased from the same traders who buy the farmer's crops at harvest. While lending to traders that extend credit to their own customers is riskier, it is also cheaper, in terms of administrative costs, than direct consumer lending by banks.

On the identification of the different coordination options, it was clear that there is not a unique scheme which could be considered as the most appropriate one in order to attenuate the constraint already mentioned. And as the problem of the agriculture development goes beyond only the credit issue, to inputs and technology availability, access to markets, transportation and stocking facilities are few among the many existents. There should by an integrated analysis of these issues in order to compute an strategic plan comprising both sectors, financial and agricultural, for the development of the agricultural sector. Here the linkages between the big and small enterprises are a key issue to be considered in order for the plan to be sustainable.

As shown in the Table 1.1, agricultural sector has been receiving a considerable level of credit from the economy (an average of 19.18% during the 1998-2001 period). But on the distribution of the credit by crops, on the Table 1.2, clearly comes out the higher allocation of the credit to the cash crop industry (the large agricultural companies and the agro-industries) producing cotton, cashew and sugar (an average of 23.44%, 13.18% and 7.42% respectively during the 1998-2001 period). Under this framework and considering that major part of the national agricultural produce comes from family farms, absorbing most of the working population, the agricultural companies and the agro-industries seems to be in better position towards the formal financial system (for credit) than the smallholders.

The agro-industrial CF scheme was shown to be a good alternative to alleviate the credit constraint problem. The results also suggest that CF can be used as a way to link small-scale farmers with agribusiness, however on condition that the correct governance structures, good relation between the parties and reduction of transaction cost are taken into account. But at the same time it is also clear that company credit is not, and does not aim to be, a substitute for the operations of the financial institutions. The range of financial services provided by the marketing companies is very narrow, consisting in most cases only of small in-kind seasonal loans.

Another important problem facing the agricultural development is the farmer defaults. This is a challenge which can be faced through introduction of different modalities, such as lending through groups, taking advantage of the fact that farmers are better informed on the credit

worthiness of community members, in addition to the cultural knowledge of the community. Another way could be co-operation between farmers, i.e., they share information on defaulters in order to be able to *discriminate* which farmer is trustable and which is under other companies' scheme. This works as the *risk centre*, which exits in most banking systems. Also is important to establish good communication with the farmers. They help foster good company-farmer relations and a sense of trust, which can contribute to the reduction of strategic default.

There also exist various problems linked with the weak legal and judiciary systems in Africa, which make enforcement of financial and commercial contracts difficult or expensive. Related to this issue is the wider problem of a lack of code of conduct between the firms and smallholders participating in credit-based input deliveries, resulting in widespread side-selling and side-buying activities. A creation of procedures and mechanisms in areas such as the regulations for collective bargaining, conflict resolution and standard contracts, as well as developing an appropriate code of conduct for these operations could improve the solution of this problem.

The public and private sector have complementary roles, based on the distinction between public and private goods. It is clear that the government should take care of such public goods as laws, law enforcement, fundamental research, public health, basic education, basic infrastructure, etc. and leave private-good activities such as animal slaughtering, cotton milling, transport of products, trade in seed, fertilizers and grain to the private sector. This is simple and straight-forward, and forms the basis for privatization. But, as noted above, relying only on government and on markets is not enough for two reasons. First, the production of private goods can be much dependent on the availability of public goods. Second, many goods have shades of public and private goods characteristics. They are hybrid or mixed goods. If the investment in hybrid goods is left to the private sector there will be under- investment.

There is also room for the government intervention aiming the improvement of the situation. Their role could be as: i) Providing seed capital, revolving funds or fiscal incentives to star-up these deals; ii) Offering favourable loan terms or insurance packages through state financial institutions; iii) Educating interested parties about experiences in other countries to improve knowledge on the subject matter through forest departments; and iv) Legal advice to interested parties and in the appropriate language and cultural setting can be provided to inform all parties of their rights in partnerships. There is no standard solution. Thus it will be country-specific and depend among other things on the level of development, the available assets and possible engines for spurring growth.

7. References

_____ (1997)."Rural Development Framework". Pretoria: South Africa: Department of Land Affairs.

ACP (2003)."Estudo das opcoes de financiamento a actividade agricola em Manica e Tete". Maputo: ADIPSA- Apoio ao Desenvolvimento de Inniciativas Privadas no Sector Agrario. 44.

Adams, S. (2000). *The Dilbert Principle: A Cubicle's-eye, view of bosses, meetings, management fads & other workplace afflictions.* UK: Boxtree.

Agrawal, P. (1999). "Contractual structure in agriculture". *Journal of Economic Behaviour & Organization*, **39** 293-325.

AJAL (1998). "Mocambique: Panorama de Investimentos". In *Oeste Agricola.* Leiria: Associacao dos Jovens Agricultores de Leiria (AJAL). In: http://www.ajal.pt/html/oesteagr1.html. 14/02/2005.

Allen, F. and Gale, D. (2000). *Comparing Financial Systems.* Massachusetts: MIT Press. 1-23.

Anderson, J. Z. (1994). "An appraisal of Contract Farmig." *Journal of Agricultural Economics*, **23**(2): 89-98.

Andrews, G., Hamilton, N. D. and Looney, J. W. (1994)."Legal aspects of livestoock production and marketing: Emerging legal issues-contract farm production." Producer Bulletin No 43. National Center for Agricultutral Law Research and Information. 4.

Awepa (1992)."Acordos de Paz." Maputo: Awepa.

Barry, P. J., Sonka, S. T. and Lajili, K. (1992). "vertical coordination, financial structure, and the changing theory of the firm." *American Journal of Agricultural Economics*, **74**(1): 1219-1225.

Baumann, P. (2000)."Equity and Efficiency in Contract Farming Schemes: The Experience of Agricultural tree Crops". Working paper 139. London, UK: Overseas Development Institute.

Benfica, R., Tschirley, D. and Sambo, L. (2002)."The impact of alternative Agro-industrial investments on poverty reduction in rural Mozambique". Research report 51E. Maputo: Directorate of Economics: Ministry of Agriculture and Rural Development. 69.

Bharadwaj, A. (2000). "Integrating Positivist and Interpretative approachs to information systems research: A Lakatosian model." In Goizueta Business School: Emory University. In:http://www.bauer.uh.edu/parks/fis/Bharadwaj.htm. 12/03/2005.

Bhatia, G. R. (1994). "Strengthening fruit and vegetables marketing for export with special reference to farmer's perticipation." *Agricultural Marketing*, **36**(4): 11-21.

Bingen, J., Serrano, A. and Howard, J. (2003). "Linking farmers to markets: Different approaches to human capital development." *Food Policy*, **28**(2003): 405-419.

BoM (2005). "Instituicões financeiras em mocambique". In Maputo: Banco de Mocambique. In:www.bancomoc.mz. 14/02/2005.

BoM, Ed.^Eds (1999). *Sistema Financeiro e Instrumentos da Política Monetária: A experiência de Moçambique.* IX Encontro de Lisboa entre os Ministros de Finanças e Governadores dos Bancos Centrais dos Países Africanos de Língua Oficial Portuguesa e Portugal. Maputo: Banco de Moçambique (BoM).

Brown, J. G. and Deloitte&Touche (1994)."Agroindustrial investment and operation." *Development Studies.* World Bank: Economic Development Institute.

Bulow, D. and Sorensen, A. (1988)."Contract farming: Does it benefi women?" Working Paper No 88.5. Denmark: Center for Development Research. 13.

Burch, D. and Rickson, R. E. (1990). "Contract farmingand rural social change: Some implications of Australian experience." *Environmental Impact Assessment*, **10**(1/2): 145-155.

CARE, PNUD and ICC (2000). "Directorio de Micro-financas em Mocambique". Maputo,

Castel-Branco, C. N. (2001)."An investigation into the political economy of industrial policy: The case of Mozambique." Unpublished PhD thesis. London. University of London. Department of economics: School of oriental and african studies. 258.

CEA "Pasta nº 107/M." Universidade Eduardo Mondlane (UEM): Centro de Estudo Africanos (CEA). 14-23.

CEA (1990)."Pasta nº 967.9: 50/O. Volume I." Maputo: Universidade Eduardo Mondlane (UEM): Centro de Estudos Africanos (CEA). xxxvii-xlii.

CEA (1990)."Pasta nº 967.9: 50/O. Volume II." Maputo: Universidade Eduardo Mondlane (UEM): Centro de Estudos Africanos (CEA). 98-119.

Coates, J., Ed.^Eds (1999). *Mercado financeiros e Rurais.* I Seminário Nacional do sector privado agrícola em Mocambique. Chimoio, CTA (Confederacao mocambicana de empresarios).

Coelho, F. (2000). *Sistemas financeiros e desenvolvimento economico: Angola no contexto africano.* 1a ed. Lisboa: Vega Editora. 120-127.

Compton, J. (2000)."Case study: Mozambique PROAGRI. "You can't learn to swim until you get into the water": Policy formulation and implementation on a practical level." Winchester: Department for International Development (DFID) Mozambique. 16.

Corbridge, S. (1993). "Marxisms, modernities and moralities: Development praxis and the claims of distant strangers." *Environment and Planning D: Society and Space*, **11** 449-472.

Coulter, J., Goodland, A., Tallontire, A. and Stringfellow, R. (2000)."Marrying farmer co-operation and contract farming for agricultural service provision in sub-saharan africa." Chatham: Natural Resources Institute (NRI). 10.

Davis, B., Reardon, T., Stamoulis, K. and Winters, P. (2002). "Promoting farm/non-farm linkages in developing countries." *Promoting/non-farm linkages for rural development: Case studies from Africa and Latin America.* B. Davis, Reardon, T., Stamoulis, K. and Winters, P. Rome: FAO and Agriculture Organization of the United Nations. 198.

de Abreu, A. P. (1999). "Quadro de Reformas do Sector Financeiro e das Finanças Públicas: Sistema Financeiro em Moçambique." In *Xitimela-CFM*. 4 (7). 70-74.

Delgado, C. L. (1999). "Sources of growth in smallholder agriculture in sub-saharan africa: The role of Vertical integrationof smallholders with processors and marketers for high value-added itmes." *Agrekon*, **38**(Special issue): 165-189.

Delgado, C. L., Hopkins, J. and Kelly, V. A. (1998)."Agricultural Growth Linkages in Sub-Saharan Africa". Research report 107. Washington, D.C.: IFPRI. 139.

DNCI (1999)."Opcoes financeiras para comercializacao agricola em Mocambique". Nota de Pesquisa No 11. Maputo: Direccao Nacional de Comercio Interno(DNCI): Ministerio de Industria, Comercio e Turismo.

Dorosh, P. and Haggblade, S. (1994)."Growth linkages in Madagascar:Implications for sectoral investment priorities." Ithaca, NY: Cornell University: Cornell Food and Nutrition Policy Program. 29.

Drabesntott, M. (1995). "Agriculturalindustrialization: Implications foreconomic development and public policy." *journal of Agricultural and Applied Economics*, **27**(1): 13-20.

Eaton, C. and Shepherd, A. W. (2001)."Contract Framing: Petnership for growth". Bulletin 145. Rome: FAO: Agricultural Services. 161.

Eicher, C. K. (2002)."Building African Models of Agricultural Extension: A Case Study of Mozambique". Washington, DC: Agricultural and Rural Development. 11.

Eswaran, M. and Kotwal, A. (1985). "A Theory of Contractual Structure in Agriculture". *The American Economic Review*, **75**(3): 325-367.

G20 (2004)."Relatorio Anual de Pobreza". Maputo: Observatorio de Pobreza (G20): Governo de Mocambique.

Gephart, R. (1999). "Paradigms and Research Methods." In *Research Methods Forum.* Research Methods Division: Academy of Management. In:http://www.aom.pace.edu/rmd/1999_RMD_Forum_Paradigms_and_Research_Methods.htm. 12/03/2005.

GoM (2001)."PARPA - Plano de Accao para a Reducao da Pobreza Absoluta". Maputo: Government of Mozambique.

Gross, B. (1994). "Contract farming in Africa, an application of the New Institutional Economics." *Journal of African Economies*, **3**(2): 231-261.

Haggblade, S., Hammer, J. and Hazell, P. B. R. (1991). "Modeling agricultural growth multipliers." *American Journal of Agricultural Economics*, **73**(May): 361-374.

Haggblade, S., Hazell, P. B. and Brown, J. (1988)."Farm-nonfarm linkages in rural Sub-Saharan Africa: Empirical evidence and policy implications". Working Paper 6. Washington, D.C.: Agricultural and rural development department: World Bank. 68.

HDR (1999)."Globalization qith human face". United Nations Development Program.

HDR (2000)."Human Development and Human Rights." New York: United Nations Development Program.

HDR (2004)."Cultural liberty and today's diverse world." United Nations Development Program.

INE (1999)."Projecções Anuais da População Total, 1997-2020". Série Estudos Nº1. Maputo: Instituto Nacional de Estatistica (INE).

INE (2000)."Atlas Socio-demografico de Mocambique." Maputo: Instituto Nacional de Estatistica (INE).

Key, N. and Runsten, D. (1999). "Contract Farming, Smallholders, and Rural Development in Latin America: The Organization of Agroprocessing Firms and the Scale of Outgrower Production". *World Development*, **27**(2): 381-401.

Kirk, C. (1987)."Contracting out, plantations, smallholders and transnational enterprise." IDS Bulletin 18 (2). University of Sussex: Institute of Development Studies. 45-51.

Kirsten, J. and Sartorius, K. (2002)."Linking agribusiness and small-scale farmers in developing countries: Is there a new role for contract farming?" Working paper: 2003-13. Pretoria: Department of Agricultural Economics, Extension and Rural Development, University of Pretoria. 26.

KPMG (2001)."Pesquisa sobre sector bancário". Maputo: KPMG Mozambique.

Levin, R. (1988). "Contract Farming in Swaziland: Peasant differentiation." *African Studies*, **47**(2): 101-120.

Macho-Stadler, I. and Perez-Castrillo, J. D. (2001). *An introduction to the Economics of Information: INcentives and contracts.* 2nd Edition. NewYork: Oxford University Press. 287.

Madsen, D. (1992). *Successful Dissertations and Thesis: A guide to graduatestudent research from proposal to completion.* 2nd Edition. San Francisco: Jossey Bass. 51-81.

Maleiane, A., Ed.^Eds (2002). Seminario sobre as opcoes de financiamento as PMEs. Maputo, CTA (Confederacao dos empresarios mocambicanos).

Maloa, M. J. B. and Nkosi, S. A. (1993). "Agricultural development through contract agents - Appropriate for smallholders?" *Development Southern Africa.*, **10**(4): 515-533.

Mukorera, O. (2001)."The Economic Impact of Smallholder Tobacco in Masindi District, Uganda". Unpublished MSc thesis. Ås. Agricultural University of Norway. Department of Economics and Social Sciences. 86.

Nanda, M. (1995). "Transnationalism of third world state and undoing of gree revolution." *Economic and Political Weekly*, **30**(4): 20-30.

Parliament Assembly (1999). "Lei das Instituicões de credito e sociedades financeiras." *Lei nº 15/99. 1st November*.

Parliament Assembly (2002). "Sistema de Administracao Financeira do Estado - SISTAFE." *Lei n.º 09/2002. 12th February*.

Pecci, F. and Lipparini, C. (1993). "Principels regional differences in contract farming." *Question Agraria*, **51** 123-146.

Porter, G. and Philips-Howard, K. (1997). "Comparing Contracts: An Evaluation of Contract Farming Schemes in Africa". *World Development*, **25**(2): 227-238.

Poulton, C., Dorward, A. and Kydd, J. (1998). "Policy Arena. The revival of smallholder cash crops in Africa: Public and private roles in the provision of finance". *Journal of International Development*, **10**(1): 85-103.

Rehber, E. (1998)."Vertical Integration in Agriculture and Contract Farming". *Private strategies, public policies & food system performance.* Working Paper 46. Bursa, Turkey: Department of Agricultural Economics, Faculty of Agriculture, Uludag University. 33.

Rogers, G. R. (1986)."The theory of output-income multipliers with consumption linkages: An application to Mauritania." PhD Dissertation. Madison. University of Wisconsin.

Ruotsi, J. (2003)."Agricultural Marketing Companies as Sources of Smallholder Credit in Eastern and Southern Africa: Experiences, Insights and Potential Donor Role". Eastern and Southern African Dision, International Fund for Agricultural Development.

Shimoda, S. (1994). "Agbiotech will vertically integrate agribusiness." *Biotechnology*, **12**(11): 1062-1064.

Singh, I., Squire, L. and Strauss, J. (1986)."Agricultural household models: Extensions, applications and policy." Baltimore and London: The World Bank.

Singh, S. (2002). "Contracting Out Solutions: Political Economy of Contract Farming in the Indian Punjab". *World Development*, **30**(9): 1621-1638.

Soy, S. K. (1996). "The Case Stude as a research method." In Austin: Archival Enterprise: Graduate School of Library and Information Science, University of Texas. In:http://www.gslis.utexas.edu/~ssoy/usesusers/l391d1b.htm. 12/03/2005.

Stiglitz, J. E., Ed.^Eds (1994). *The role of the state in financial markets.* WOrld Bank annual conference on development economics. The IBRD: The World Bank.

Stock, J. H. and Watson, M. W. (2003). *Introduction to Econometrics.* International Edition. Boston: Pearson Education, Inc. 696.

Strasberg, P. (1997)."Smallholder cash-crooping, food-crooping and food security in northern Mozambique". PhD Dissertation. Michigan: East Lansing. Michigan State University.

UEM (1989)."Presente e perspectivas". Maputo: Universidade Eduardo Mondlane (UEM): EMU.

UN (2004). "Mozambique". In United Nations (UN): CarthographicSection of the Department of Peacekeeping Operations. In:http://www.un.org/depts/dhl/maplib/worldregions.htm. 14/02/2005.

Warning, M. and Hoo, W. S., Ed.^Eds (2000). *The Impact of Contract Farming on Income Distribution: Theory and Evidence.* Western Economics Association International Annual Meetings.

Warning, M. and Key, N. (2000). "The Social Performance and Distributional Impact of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal". *World Development*, **30**(2): 255-263.

Warning, M. and Key, N. (2002). "The Social Performance and Distributional Consequences of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal". *World Development*, **30**(2): 255-263.

Watts, M. J. (1992). "Peasant and flexible accumulation in the third world: Producing under contract." *Economic and Political Weekly*, **27**(30): 90-97.

WB (2003)."World Development Report 2003." New York: Oxford University Press: World Bank.

WB (2004). "World Development Indicators". In World Bank. In:http://www.worldbank.org/data/wdi2004/index.htm. 15/04/2005.

WB (2004)."Mozambique at glance." World Bank group (WB). 2.

Weatherspoon, D., Cacho, J. and Christy, R. (2001)."Linking globalization, economic growth and poverty: Impacts of agribusiness strategies on sub-saharan africa." Staff paper 2001-06. New York: Ithaca: Cornell University: Department of applied economics and management.

Woods, G. (2002). *Research papers for dummies.* New York: Hungry Minds, Inc. 337.

Wright, D. (1989). "Contract Farming Agreements." *Farm Management*, **7**(14): 177-184.

WV (1999)."County profile: Mozambique". World Vision Australia (WV). 2.

Appendix A

Theoretical build up

A.1. Socio-historic and political profile of Mozambique

Socio-historic and political profile of Mozambique

Mozambique, in the south-eastern cost of Africa (Figure 1), is located between the parallels 10°27' and 26°56', latitude south and the meridians 30°12' and 10°27' to the east. According to the World Bank (WB), in 2002 18.4 millions inhabited this country (WB, 2004b), with over 80% living in rural areas (Benfica, Tschirley and Sambo, 2002) and with an illiteracy rate about 56% amongst the adult population (WB, 2003). According to the National Statistics Institute (INE), the country is administratively divided into eleven provinces including the capital of the country, Maputo City, which also has the status of a province. Each province is divided into capital and districts which further divided into administrative posts. In total, Mozambique has 144 districts, 33 municipalities, 68 towns and 387 administrative posts (INE, 2000).

The country is crossed by several rivers including the Zambezi, and vegetation ranges from rainforest to grassy plains and semi-desert. The climate is hot and humid from October to March (the rainy season) but generally dry for the rest of the year. Both droughts and floods cause problems for farmers from time to time. Among 18.4 million Mozambicans, about 45% are under 15 years, so the population will keep growing rapidly. The capital Maputo has over a million inhabitants. There are ten major ethnic groups, and more than 30 different languages are spoken. Because of the colonial past, Portuguese is the official language, but English is increasingly been used. There is religious diversity: as well as many animists, there are large groups of Christians and Muslims (WV, 1999).

According to the WB classification of countries based on Gross National Income (GNI) per capita, Mozambique is ranked as a developing, low-income economy and in debt, with a total Gross National Product (GNP) being estimated in 1997 at USD 2.4 billions, and the per capita GNP at USD 143 (HDR, 2000). Currently, the Gross Domestic Product (GDP) per capita is estimated at USD 195 (HDR, 2004). The government is still heavily dependent on external support, currently constituting about 17% of the overall GDP.

The history of Mozambique can be traced as follows. Uring the period 1948-1975, it was a Portuguese colony. During this period, Portugal established a feudal system of ownership, which can be said to have enhanced the system of forced labour (known as *Chibalo*), for Mozambicans. During the late 1950s, a resistance emerge, the FRELIMO[1] founded by Eduardo Mondlane and other Mozambicans. Since 1964, Mozambique became engaged in an armed campaign against the occupation of the Portuguese colonial powers, ultimately resulting in the signing of the historical Lusaka Agreement (Acordos de Lusaka) in September 1974. This allowed for a

[1] FRELIMO – the Mozambican Liberation Front, which has governed the country since 1975.

transfer of power from the Portuguese colonial government to FRELIMO after on the 25th of June 1975.

Figure 2 Map of Mozambique
Source: UN, 2004.

Post-independence, many of the portuguese population, along with local skilled and professional staff, started to leave the country. This exodus to Portugal (accompanied by sabotage of existing physical and social infrastructure) to neighbouring countries such as South Africa and the then Rhodesia, had an adverse effect on the country's economy. For example, only 5 academic staff remained in the only university in the country (UEM, 1989). In order to address the resulting constraints in multiple spheres of development post-independence, the government started to layout and institutionalize radical reforms in all the economic spheres, based on centralized planning and grounded in socialist principles. Private schools were closed, businesses nationalized, and collective farms organized. In addition, the new government launched an ambitious economic program known as PPI (Indicative prospective plan), which had as target a rapid industrialization of Mozambique within 10 years period based on development by the State of enormous agriculture and industrial projects. But being an exuberantly ambitious and inadequate to the real necessities and capabilities it failed to conquer the target set after only

three years because investment resources, in particular foreign exchange and public savings, were exhausted (Castel-Branco, 2001).

Civil war began in the early 1980s between FRELIMO and RENAMO[2], which undermined much of the ongoing reforms efforts that the government was undertaking. During this period, the country's infrastructure, physical and communication infrastructure in the country, including telephone lines, and roads, the economic activity, health facilities and schools, were consistently targeted and destroyed for nearly two decades. This contributed to the problem of poverty and the general ruin of the socio-economic status of the population.

As response, the government implemented the Economic and Social Rehabilitation Program[3] (ESRP) in various sectors, while joined the International Monetary Fund (IMF) in 1984, and initiated various policy reforms from 1987. However, these efforts were complex to implement because of the intensification of the war that was affecting most parts of the country, especially in the rural areas, which led to increasing the economic difficulties for vulnerable groups. The civil war seriously affected socio-economic development processes leading to inequity in growth, still being felt today. In addition, during 1990 and 1992, the loss of an important aid and export source, Soviet Union and drought that affected the region worsen the economic growth.

After various rounds of negotiations between FRELIMO and RENAMO, the next phase of the country's history can be seen to start after the signing of the peace agreement in 1992, which marked an end to the civil war (Awepa, 1992). This agreement led to free and peaceful multiparty elections in 1994. With the election of the new government, the country started to accelerate the implementation of the ESRP to meet the enormous challenge of economic and social rehabilitation. Nevertheless these various efforts, in the post-conflict years, the country has repeatedly been ranked as one of the poorest countries in the world (HDR, 1999).

Since then Mozambique has been following a positive path of economic recovery, as a result of the macro-economic policy, considered worldwide to be the appropriate, in terms of structural reforms, like privatizations, financial system reform among others, as for the well managed monetary and foreign exchange policy and some budget contention (Coelho, 2000). Though, due to historical legacy of colonial rule and the civil war, the achievements of the ESRP have been considerably way below expectations, resulting in extremely poor economic and low social indicators as compared with other SSA countries. Currently the country's GDP is USD 4.3 billions, 54% of the population below national poverty line, 41 year of life expectancy and 60% of illiterates (WB, 2004a).

[2] RENAMO – Mozambican National Resistance.
[3] According to CEA, ESRP had three main objectives: poverty alleviation, economic growth enhancement and development of institutional capacity.

There is a broad political consensus that the main causes of the poverty are rural isolation, poor infrastructure and communication, poor health, low levels of education and an unfavorable climate for investment and trade (Compton, 2000). Nevertheless, both the Ministry of Finance (MF) and Agriculture (MA) have produced guideline documents compounded by series of policy initiatives, like SISTAFE[4] and PROAGRI[5] respectively, and the Action Plan for Absolute Poverty Reduction (PARPA[6]), with the purpose of improving their sectors performance (GoM, 2001), and to support the general reconstruction and national development of the economy. While PARPA consigns objectives, targets and strategies for the national development policy, PROAGRI defines specific objectives and targets for the agricultural sector and rural development, and SISTAFE for the financial sector.

As for the living conditions, in terms of average income, Mozambique is one of the world's poorest countries, reflecting colonial neglect followed by years of war. Many households struggle to meet their own needs - poor urban families spend more than 70% of their income on food, and a crop failure can be disastrous for farmers. The basic diet of white maize or cassava made into porridge is high in carbohydrates but lacking in protein, vitamins and minerals. Rural villages are usually groups of circular straw or mud houses built near the fields. Many households rely on rivers, lakes or wells whose water is not safe to drink. Urban housing includes brightly painted cement apartments as well as makeshift homes constructed from scrap materials on the edge of town (WV, 1999).

In the health sector malaria (which in turn causes energy-sapping anemia), measles, diarrhea, acute respiratory infections and tetanus are significant problems. The incidence of HIV/AIDS is increasing, especially along major transport routes. Poverty, malnutrition and poor sanitation contribute to illness and many child deaths. By the late 1990s, two-thirds of children enroll at primary school, but a shortage of trained teachers, materials and classrooms leads to low pass-rates and consequent drop-outs. Access to education beyond grade five is even more limited (WV, 1999).

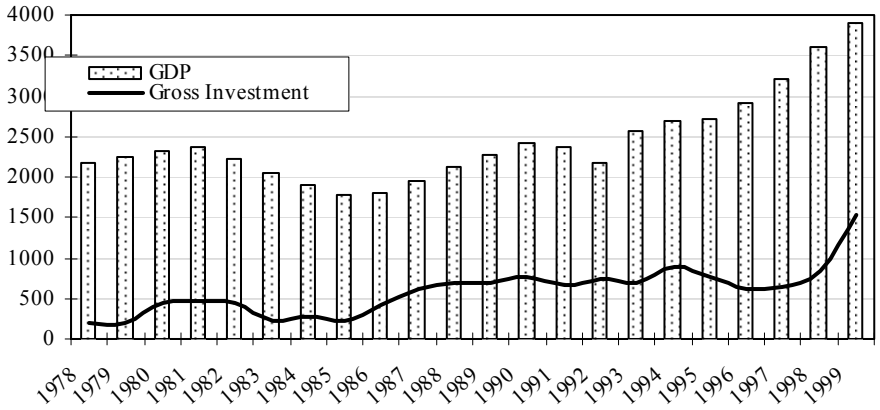
As for the economic performance, over the last four decades, the relationship between investment and economic performance was very close up to 1980 (Graph 1), when investment and economic growth moved in opposite directions, due to the PPI, which is associated with massive increase in investment in large projects. Quite apart from a time lag between investment

[4] SISTAFE constitutes an integrated management systems, constituted by systems, subsystems, norms and administrative procedures related to Government finances and patrimony management In Parliament Assembly (2002)

[5] It is also referred as National program of public investment in agriculture is a 5 year agricultural sector investment and also aims the reform of the MA. Currently the second phase of it (PROAGRI II) is ongoing.

[6] PARPA, a comprehensive framework conceived as an instrument within the public planning system that makes the government's five-years program operational. The key objective of PARPA is the reduction of absolute poverty and the main areas of focus are: education, health, agriculture and rural development, infrastructure, good governance and macroeconomic and financial management, In GoM (2001).

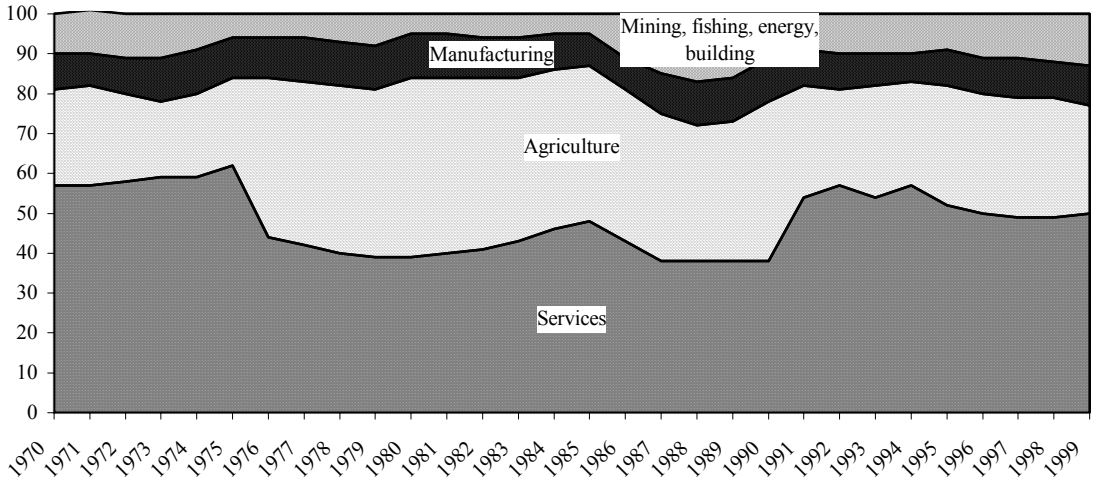
and output growth, which is more noticeable with large investment programs, the investment plan for manufacturing had three negative effects (Castel-Branco, 2001).



Graph 3 GDP and Invetment (1996 prices – USD millioin)
Source: Castel-Branco, 2001.

First, existing capacity became largely under-utilised as result of the crowd-out of the funding. Second, most large projects were either not completed or did not receive the material inputs to work at close to full capacity. Third, massive investment financed through foreign borrowing quickly resulted in unsustainable debt service that forced the investment programme, and the projects associated with it, to collapse.

The very pronounced increase in investment after 1997 (Graph 1) is explained by the large projects: sugar, cement, beer and, above all, Mozal and Motraco (aluminium smelter and its power station). The magnitude of these projects also implies that the time lag between investment and output growth is large (Castel-Branco, 2001) Services constitute the main component of GDP (Graph 2). The second most contributing to the GDP is the agricultural sector, with 33.67% on average for the period, followed other industries with an average of 10.10% and by the manufacturing sector with an average of 9.44% (Castel-Branco, 2001).



Graph 4 Sectored distribution of GDP
Source: Castel-Branco, 2001.

A.2. Mozambican Agro-industry characterization

Mozambican Agro-industry characterization

A plethora of different institutional arrangements can be found worldwide prevailing in the relationship between productions, trade, and processing. In Mozambique, those forms can be summarized in three different types defined on the basis of the degree of vertical coordination between farmers and off-farm (or non-farm) businesses, namely: SM trading (coordination without any contract), CF and VI (ownership integration or plantation agriculture). Out of that continuum but interacting to a great extent in the dynamics of the markets is also the farmers cooperatives (rural associations – FC) (Benfica, Tschirley and Sambo, 2002; Rehber, 1998). In some countries, NGOs also play an important role, as intermediaries, with the goal of helping those groups become profitable businesses associations. This section intends to characterize of the agro-industry activity and situate those different types of vertical coordination under the Mozambican agro-industry framework.

Agro-industry and inter-institutions relations

Rural agro-industrial development has the potential, if properly structured to relate to smallholders, to help reduce the rural poverty level, which for Mozambique is about 71% in about 80% of the country's population living in rural areas. The influence of a particular agro-industry in a given region varies depending on the set of factors that condition the relationship between the agro-industry and rural smallholders, from the crop specific characteristics to the economic and politic environment. The rural smallholders can benefit in terms of wage employment, increased income from the supply of raw material to the processing firms (Benfica, Tschirley and Sambo, 2002).

The role of agro-industrial investments in reducing rural poverty levels in the country, in very general terms, is recognized in the PARPA (GoM, 2001). However, the development of specific strategies to enhance the impact of these investments on rural poverty in a consistent and sustainable manner has been target of little attention. Many questions regarding which and how to get the right kind of agro-industrialization are still to be answered – the kind that stimulates employment, reduces poverty and real food prices, stimulates real wages, improves food safety and protects the environment.

The following paragraphs presents of an overview of the current agro-industrial investments in the country. Special emphasis is given to: i) How current agro-industrial investments fit within the broader universe of rural based investments; and ii) Characterization of the sub-sample of investments in agro-industry with respect to location, relationship with the smallholder sector,

sources of finance and market orientation and in the exposition of the Mozambique's agro-industry characterization.

Sectored distribution of the rural based[43] investments

There has been a remarkable increase in the volume of investment in rural based projects, including agro-industry, over the past 15 years (see Table 2). The majority of the rural based projects (Table 1) are in the area of agriculture and livestock (43.6%) without a processing component, though representing only 22% in terms of investment value. Agro-industrial investments are the second major subgroup (34.7%) of all rural based projects. The remaining are projects in forestry and wood-works and other rural based projects. In terms of total value invested, agro-industry is the most important sector accounting for 59% of the total invested in the period. The average value of agro-industrial investments is also higher than the ones for the other sectors of activity.

Table 3 Sectored Distribution of Rural Based Investment Projects

Sectors of activity	All rural based Projects				
	Distribution of projects		Value of Investments		
			Total		Annual Average
	Number	%	USD (10^3)	%	USD (10^3)
Agriculture and Livestock	142	43.6	218,264.95	22.07	1,537.08
Agro-industrial*	113	34.7	588,083.19	59.47	5,250.74
Forestry/Wood-processing	60	18.4	174,448.65	17.64	3,007.74
Other**	11	3.4	8,147.73	0.82	740.70
Total	326	100	988,944.52	100.00	2,634.07

Source: 1985-2001 Project Database based on the CPI archives.
*Agro-Industry refers to any project that has an agricultural processing component, with or without a direct agricultural production component.
** Other rural based projects

Sub-sectored distribution of the agro-industrial investment

There has been a significant inflow of capital to support investments from the signature of the peace agreement in 1992 and the subsequent first democratic elections of 1994 as shown in the Table 2. The total value invested in all rural based investment increased about 6.1 times from the period 1985-1990 to 1991-1996, but the level of investment on agro-industry did not accompanied this growth, it lagged behind, growing only 5.2 times. Then both more than doubled from that period to 1997-2001, having the agro-industrial investment decreased in about 0.22 percentual points. Over the entire period, the focus of investment has moved from cotton to a higher diversification of investments in sectors like maize and cashew, in the first half of the 1990's, and in sugar and tea in late 1990's.

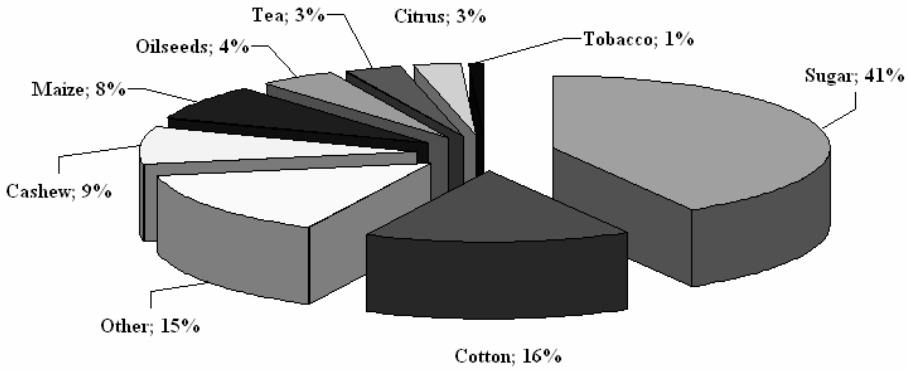
[43] The term rural based projects refers to those located in rural or peri-urban areas, employing directly or indirectly rural population and working with raw materials (or livestock) typically grown (or raised) in rural areas. These include activities such as medium and large-scale agriculture and livestock production, forestry and wood processing, wildlife related businesses, and agro-industrial activities.

Table 4 Agro-industrial investments by sub-sectors

Sub-sectors ranks	% of total Agro-industrial investment and sub-sector ranking							
	1985-1990		1991-1996		1997-mid 2001		Total	
	Sectors	%	Sectors	%	Sectors	%	Sectors	%
1	Cotton	97.44	Cotton	26.55	Sugar	64.08	Sugar	41.53
2	Tobacco	2.56	Cashew	25.44	Other	13.82	Cotton	15.72
3	-	-	Other	20.09	Tea	5.26	Other	14.88
4	-	-	Maize	19.63	Oilseeds	4.66	Cashew	8.51
5	-	-	Oilseeds	4.81	Citrus	3.84	Maize	7.85
All rural based investment								
Value (USD 10^3)	48,461.28		293,436.67		647,046.56		988,944.52	
Agro-industrial investment								
Value (USD 10^3)	33,481.28		173,477.07		381,124.83		588,083.19	
% of all rural	69.09		59.12		58.90		59.47	

Source: 1985-2001 Project Database based on CPI Archives.
Notes: There are in total nine (9) processing sectors included: Maize, sugar, tea, cashew, tobacco, fruits, oilseeds, cotton and other. Other includes a mix of processing sectors, including coconut, rice, pigeon pea, wheat, etc. Since we are only counting the first 5 major investments per period, the percentages do not necessarily sum up to 100.

In terms of the overall accumulated investment over the 15 years analysed, the sugar sub-sector is the one targeted with the highest amount of investment, followed by the cotton sub-sector. The tobacco amounted to an investment of USD 4,118,820.00. Cashew sub-sector ranked 4th comprising an accumulated investment of USD 50,021,439.25. It is important to point here that the investment in the sugar industry is mostly on SM and VI coordination. Cashew sub-sector's most investments are realized on SM basis. On the other hand, cotton's investments are targeted in CF type of coordination.



Graph 1 Agro-industrial investments by sub-sector
Source: 1985-2001 Project Database based on the CPI archives.

Agro-industrial investment distribution by type of vertical coordination

As shown in the Table 3, 68% of the all projects fall within those seen as having forward production linkages with smallholders, as independent producers, in rural areas. This type of coordination, the SM, comprises the highest invested amount relatively to the other two, about 45% of the amount invested in the period. Cashew, maize and oilseeds are the major sub-sectors targeted by SM in terms of agro-industrial investment projects (Table 3). In spite of representing small share of overall agro-industrial investment projects, the sub-sector of sugar represents

Table 5 Vertical coordination type, location and sub-sectored distribution of agro-industrial investments

Sub-sector	Agro-industrial investment projects				Value invested in Agro-industrial projects (USD 10^3)				Top three locations	
	% within type of link									
	SP	CF	VI	Total	SM	CF	VI	Total	% of invest. projects	% of value invested
Maize	18	1	3	22	44,266.84	603.99	1,277.11	46,147.95	Maputo	Maputo
	26.47	4.55	13.04	19.47	16.90	0.45	0.66	7.85	Nampula	Niassa
									Sofala	Nampula
Oilseeds	16	1	1	18	24,405.36	1,260.00	436.96	26,102.32	Inhambane	Inhambane
	23.53	4.55	4.35	15.93	9.32	0.95	0.23	4.44	Nampula	Nampula
									Maputo	Zambézia
Sugar	1	-	2	3	109,255.00	-	135,000.00	244,225.00	Maputo	Maputo
	1.47	-	8.70	2.65	41.71	-	69.81	41.53	Sofala	Sofala
Tea	1	1	5	7	4,233.48	3,408.54	12,423.80	20,065.82	Zambézia	Zambézia
	1.47	4.55	21.74	6.19	1.62	2.57	6.42	3.41		
Cotton	1	15	-	16	237.56	92,211.20	-	92,448.76	Nampula	Cabo Delgado
	1.47	68.18	-	14.16	0.09	69.41	-	15.72	Zambézia	Zambézia
									Sofala	Nampula
Tobacco	1	1	1	3	2,910.00	351.54	857.28	4,188.82	Manica	Maputo
	1.47	4.55	4.35	2.65	1.11	0.26	0.44	0.70	Maputo	Manica
Cashew	20	-	1	21	41,021.44	-	9,000.00	50,021.44	Nampula	Gaza
	29.41	-	4.35	18.58	15.67	-	4.65	8.51	Gaza	Nampula
									Inhambane	Sofala
Citrus	8	-	1	9	17,315.74	-	114.25	17,430.00	Manica	Manica
	11.76	-	4.35	7.96	6.61	-	0.06	2.96	Nampula	Cabo Delgado
									Gaza	Nampula
Other	2	3	9	14	18,244.81	35,013.22	34,265.07	87,523.09	Nampula	Zambézia
	2.94	13.64	39.13	12.39	6.97	26.36	17.72	14.88	Zambezia	Nampula
									Maputo	Sofala
Total	68	22	23	113	261,860.22	132,848.49	193,374.47	588,083.19	Maputo	Maputo
	100	100	100	100	100	100	100	100	Nampula	Sofala
									Zambezia	Zambézia

Source: 1985-2001 Project Database based on the CPI archives.

the major target in terms of value of investment, among the sub-sectors, followed by the maize and cashew sub-sector. It is important to note here that although constituting the highest in terms of accumulated value of investment, the SM arrangement in terms of average value invested falls to the last rank.

VI and CF arrangements amounts 23% and 22% respectively of the approved projects. As for the amount of investment for the all-period, VI arrangement comes in the second place, after the SM arrangement, representing 33%. On average, VI arrangement was the one with the highest amount of investment of USD 8,407,585.75, inducing the idea that it requires highest level of investment relatively to other two institutional arrangements in order to be operational. This reflects the capital-using or labour-saving nature of the institutional arrangement. The tea sub-sector, in Zambézia province, is the one with higher number of projects with VI arrangement in view, comparatively to the other sub-sectors. However, the sugar sub-sector attains the highest rank concerning the value of investment (Table 3).

Concerning the CF arrangement, although it represents the lowest accumulated amount of investment, USD 132,848,492.62, over the period 1985-2001, in terms of average value of investment it ranks in second position, above the SM arrangement, with USD 6,038,567.85 (Table 4). This type of institutional arrangement is predominant in cotton, tobacco, tea and oilseeds production areas. It is important to point out the recent emergence of the investments by several tobacco companies in CF and processing operations in the north of the country, like Tete.

Table 6 Agro-industrial investments by institutional arrangements with smallholders

Vertical coordination type	Agro-industrial investment				
	Distribution of projects		Value of investments		
			Total		Average
	Number	%	USD (10^3)	%	USD (10^3)
SMs – processing with independent smallholder producers (SM)	68	60.18	261,860.22	44.53	3,908.36
Contract coordination – processing with CF (CF)	22	19.47	132,848.49	22.59	6,038.57
VI – processing with plantation agriculture (VI)	23	20.35	193,374.47	32.88	8,407.59
Total	113	100	588,083.19	100	6,118.17

Source: 1985-2001 Project Database based on the CPI archives.
Note: Given its nature, Farmer Cooperatives/Community Integration (FC) arrangements are not included in this analysis.

Agro-industrial investment distribution by location

When looking at the distribution by province of the rural based and agro-industrial investments, Table 5, an uneven distribution and somewhat concentrated comes up to the observers' eye. Of the all investment projects, 44% are located on the south part, 68% of which are in Maputo province. As we move towards north, the level of investment diminishes. We find that 32% are located in the centre and the remaining 24% in the north. The reasons explaining the uneven distribution are: i) The structure and the conditions of the rural marketing infrastructure; ii) The differential natural

resource base across the regions; and iii) The inherited structure of investments left by the colonial settlers and the lack of coherent rural and agro-industrial development policies in the past decades (Benfica, Tschirley and Sambo, 2002).

From the estimated total of USD 973,948.00 invested during the period, the central and south part of the country, differently from the project distribution, had an equal amount invested of about 42% of the total investment of the period in analysis. The north part, as in terms of the number of projects, ranked last with 17% of the total amount invested in the period. Maputo province had about 34% of the total investment, the highest of the country, followed by Sofala and Zambézia province on the central part, with 22% and 13% respectively. As for the north part, Nampula province was the one that got the most interest from the investors, getting 8% of the overall investment realized.

Turning to the distribution of the institutional arrangements over the country (Table 5), in terms of number of projects, the SM and VI arrangement is predominantly present in Maputo province, particularly in the maize milling sub-sector and sugar respectively (Table 3). This province also toped in the maize milling and sugar sub-sectors, in terms of the investment value, on the SM and VI arrangement respectively. In respect to SM arrangement, the central provinces of Manica and Sofala have some important emerging investments in mango and citrus, which have very significant growth prospects for the coming years. These investments rely heavily on Middle Eastern capital and have a secure export market in that region (Benfica, Tschirley and Sambo, 2002).

Regarding the CF arrangement, Zambézia and Nampula provinces are the most targeted ones in terms of number of investment projects, accounting about 29% and 24% respectfully. The predominant regions, in terms or value of investment, that together account for over half of the CF investments in the country are Nampula and Zambézia provinces, especially in cotton sub-sector. A recent phenomenon under this arrangement is Tobacco production. In terms of values invested in CF types of projects, from the estimated USD 130,446.00 invested in the period, in Zambézia, Cabo Delgado and Nampula accounted 40%, 25% and 13% respectfully.

Agro-industrial investment distribution by source of funds

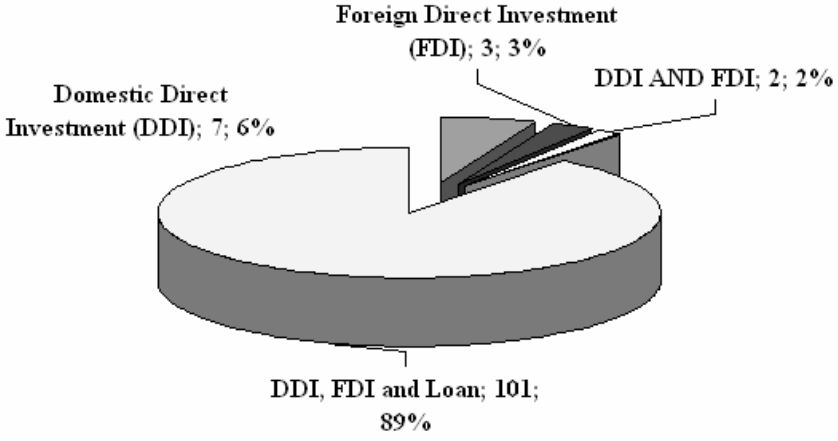
Mozambique is the last 13 years, since the peace agreement between the FRELIMO and RENAMO, has been one of the most looked at country, among many other developing countries, by the international community due to, mainly its economic performance and poverty reduction policies. This way it has been targeted by FDI and also by a growing NDI. In specific 6% off the agro

Table 7 Rural based and Agro-industrial investments by province

Province	Rural based projects		Agro-industrial projects							
			SP		CF		VI		Total	
	No.	Value (USD 10^3)	No.	Value (USD 10^3)	No.	Value (USD 10^3)	No.	Value (USD 10^3)	No.	Value (USD 10^3)
	% (of projects)	%	% (of projects)	%	% (of projects)	%	% (of projects)	%	% (of projects)	%
Niassa	12	15,234.87	1	3,257.42	1	4,288.08	1	437.00	3	7,928.50
	3.68	1.54	1.47	1.24	4.55	3.23	4.53	0.23	2.65	1.36
Cabo Delgado	22	71,391.95	5	6,379.35	2	33,227.99	-	-	7	39,607.34
	6.75	7.22	7.35	2.44	9.09	25.01	-	-	6.19	6.73
Nampula	40	77,268.82	15	23,406.97	5	17,123.12	4	21,725.01	24	62,255.10
	12.27	7.81	22.06	8.94	22.73	12.89	17.39	11.23	21.24	10.59
Zambezia	30	124,543.66	3	9,820.50	6	52,794.40	6	12,771.80	15	75,386.70
	9.20	12.59	4.41	3.75	27.27	39.74	26.09	6.60	13.27	12.82
Tete	5	19,530.13	1	45.18	-	-	-	-	1	45.18
	1.53	1.97	1.47	0.02	-	-	-	-	0.88	0.01
Manica	37	51,622.39	3	11,927.35	2	2,561.11	2	971.53	7	15,504.99
	11.35	5.22	4.41	4.57	9.09	1.93	8.70	0.50	6.19	2.64
Sofala	36	219,110.11	3	19,932.39	4	11,080.57	2	72,460.04	9	103,473.00
	11.04	22.16	4.41	7.61	18.18	8.34	8.70	37.47	7.96	17.59
Inhambane	16	18,796.64	10	15,493.09	-	-	-	-	10	15,493.09
	4.91	1.90	14.71	5.92	-	-	-	-	8.85	2.63
Gaza	31	63,067.78	7	12,547.42	2	11,773.22	1	9,000.00	10	33,320.64
	9.51	6.38	10.29	4.79	9.09	8.86	4.35	4.65	8.85	5.67
Maputo	97	328,378.16	20	159,005.55	-	-	7	76,009.13	27	235,014.68
	29.75	33.20	29.41	60.72	-	-	30.43	39.31	23.89	49.96
Total	326	988,944.51	68	261,860.22	22	132,848.49	23	193,374.47	113	588,083.19
	100	100	100	100	100	100	100	100	100	100

Source: 1985-2001 Project Database based on the CPI archives.

industrial projects were funded by the DDI and 3% by the FDI. Joint forces between the FDI, DDI and the Loans given have contributed by 89% in the projects approved.



Graph 2 Agro-industrial projects by source of funds
Source: 1985-2001 Project Database based on the CPI archives.

Categorizing the amount invested by the type of funding, we see that, in the Table 6, 64.21% of the investment has come from Loans. And contrary to the shown above, where higher number of projects is funded by the DDI (6%), of the overall amount of invested amount 20.35% is FDI and 44% of DDI. The CF scheme has major part of its funding, from Loans, followed by the FDI. The FDI has as target the VI schemes and the DDI relies more on SM schemes. This can be justified as the domestic investors' beliefs that higher fixed cost level is not good for agro-industrial business, additionally to the fact of poor infrastructural framework. On the other side the foreign investors may believe in controlling the production process, controlling thus the quantity and above all the quality of the produce.

Table 8 Agro-industrial investments by type and by institutional arrangement types

Source of funds	Agro-industrial projects			
	SM	CF	VI	Total
	Total value invested (USD 10^3)			
	Total value invested in %			
Domestic direct investment (DDI)	39,639.85	24,574.87	26,572.65	90,787.37
	15.14	18.50	13.74	15.44
Foreign direct investment (FDI)	42,626.59	28,716.91	48,682.28	119,661.78
	16.14	21.62	25.18	20.35
Loans*	179,957.78	79,556.72	118,119.55	377,634.04
	68.72	59.89	61.08	64.21
Total	261,860.21	132,848.49	193,374.47	588,083.19
	100	100	100	100

Source: 1985-2001 Project Database based on the CPI archives.
* It includes domestic and foreign loans.

The Table 7 shows an overview of the type of market targeted by the agro-industrial investment, considering each of the coordination type. It indicates that while most of SM and VI investments are oriented towards the domestic market or to a combination of domestic and foreign, CF are mostly oriented towards the export markets or to a greater extent to a combination but not to the

domestic market alone. As can been seen higher level of investments is realized in a diversification strategy, i.e., targeting both markets.

Table 9 Agro-industrial investments by market orientation

Market Orientation	Agro-industrial projects			
	SM	CF	VI	Total
	% of projects Total value invested (USD 10^3) Total value invested in %			
	39.71	-	47.83	33.63
Domestic market	55,754.63	-	22,031.14	77,785.77
	21.29	-	11.39	13.23
	4.41	31.82	4.35	9.73
Foreign market (exportation)	2,489.50	55,186.98	1,618.70	59,295.18
	0.95	41.54	0.84	10.08
	55.88	68.18	47.83	56.64
Domestic and foreign market	203,616.09	77,661.52	169,724.63	451,002.24
	77.76	58.46	87.77	76.69
	100	100	100	100
Total	261,860.22	132,848.49	193,374.47	588,083.19
	100	100	100	100

Source: 1985-2001 Project Database based on the CPI archives.

Agro-industry and CF in agriculture

The CF arrangements are best viewed in SSA as a response to widespread failure of input and credit markets and to poor or absent service provision. In addition to the need to ensure sufficient volume of purchases to reduce unit processing costs, concerns about product quality often significantly affect the structure of these relationships (Ruotsi, 2003; Benfica, Tschirley and Sambo, 2002; Key and Runsten, 1999; Rehber, 1998; Porter and Philips-Howard, 1997; Watts, 1992). Examples of CF in Mozambique are predominantly found in the cotton and tobacco sub-sectors. Most schemes take the form of forward resource/management contracts. According to Jaffee and Morton (1995) those differ from the simple sale/purchase contracts because they include stipulations regarding the transfer and use of specific resources and/or managerial functions (Benfica, Tschirley and Sambo, 2002). Forward resource management contracts partially internalize product and factor transactions, and are sometimes referred to as interlinked contracts or interlinked markets (Poulton, Dorward and Kydd, 1998).

Currently in the country, farmers have little access to agricultural inputs and credit markets due to the market failure in rural areas. The contracts, most of which are informal, are designed to fill that gap and consist essentially in firms supplying credit, seeds and other inputs (including chemicals) and technical assistance for the production to farmers on specific areas of land of the product in question and farmers to use those inputs as instructed, and to sell their production to the firms at harvest at agreed-upon prices. The costs supported by the firms are deducted at the time of the harvest. In most cases, government has granted the firm monopsony power, i.e., the

farmers are not allowed to sell outside the scheme they are assigned to. To reduce transaction costs, where farmer associations have been established, firms have frequently signed contracts with associations that represent a group of farmers (Benfica, Tschirley and Sambo, 2002). This scheme is normally implemented in land "owned" by the individual farmers or farming communities, but there are cases where the firms use designated areas or blocks within their own land concessions for that purpose (Strasberg, 1997).

But this scheme also comprises several potential limitations. First, widespread contractual coordination may raise price volatility in the remaining SM transactions, due to the thinness of those markets and the lack of transparency across many contracts within the same sub-sector. This will reduce or distort the information supplied by those SM prices. Second, CF arrangements may result in barriers to entry for farmers when processors limit suppliers to those who have given capabilities of meeting volume and standard requirements or have selected characteristics in the community - the already better off farmers for example. Third, these arrangements may result in a highly asymmetric bargaining situation where one or fewer buyers, often with monopsony power, can largely determine the prevailing price. Fourth, the cost of enforcing contract provisions can be very high due to opportunistic behaviour by participants (both farmers and processors) and weaknesses in the existing legal system. As a result, CF is not always an economically viable alternative in the SSA setting (Benfica, Tschirley and Sambo, 2002).

In terms of main characteristics of CF type of coordination in Mozambique we have the following: i) 22.59% of the investment in the agro-industrial sector so far realized were in CF schemes; ii) The FDI portion (21.62%) of the investment is ranked in the second position, after the Loan; iii) 41.45% of the investment is oriented for the foreign market only; iv) Cotton, tobacco, tea oilseeds and maize production use to some extent CF scheme; v) Cotton and tobacco are the ones with higher level of investment using CF scheme; and vi) CF is more predominant in the northern part of Mozambique, specifically in Cabo Delgado and Zambézia.

A.3. Growth linkages and rural development

Growth linkages and rural development

Agro-industrial investments can have direct (1st round) and indirect (2nd round) effects on the rural development[1]. The direct effects correspond to the immediate effects like income variations and employment. The indirect effects are related to the way direct effects influence other aspects of socio-economic life of the rural area. These spin-off effects on local activities from the spending of increased farm incomes are called *agricultural growth linkages,* quantified through growth multipliers, and they were shown to be an important element in the creation of rural industry in Asia following the Green Revolution in cereals production. There are six types of intra-sector linkages, two in the factor markets (capital and labour) and two in the production markets (backward and forward production), and two in the expenditure market (consumption and investment linkages) (Benfica, Tschirley and Sambo, 2002; Davis, et al.,B. Davis, Reardon, T., Stamoulis, K. and Winters, P., 2002; Delgado, Hopkins and Kelly, 1998).

The type of investment also plays an important role in influencing the capacity of the farmers' organizations to make their own socio-economic choices and become full actors in the market. With the *contract/business* type of investment the opportunity to influence agricultural and rural development policy may arise, but the issues tend to be limited to specific commodities or products that are part of a company's investment program. In this case, democratic conditions that create opportunities for negotiation are essential for farmers to become part of the main stream business and civil society. Without such conditions, there might be little incentive or pressure for companies to accommodate to farmer demands (Bingen, Serrano and Howard, 2003).

With the *process/technology* type of investment non-governmental organizations or various types of donor-funded projects frequently limit the opportunities to develop farmer capacity for problem-solving and tend to define a continuing role for themselves as outside mediators. Farmer access to agricultural goods and services is limited and is often subordinated to, or dependent upon, the source of external funding. The investment in *process/human capacity* requires a long-term and focused commitment to develop human skills and social capital, including support for collective self-help capacity building. In contrast to technology-driven efforts, this type of investment values and encourages learning in order to deal with a broader set of actors and market opportunities. Based on this investment, access to agricultural goods and services tends to be demand driven as farmers play a key role in identifying their needs, and in capitalizing and managing their organizations (Bingen, Serrano and Howard, 2003).

[1] Rural development is considered helping rural people set the priorities in their own communities through effective and democratic bodies, by providing the local capacity; investment in basic infrastructure and social services. Justice, equity and security; dealing with the injustices of the past and ensuring safety and security of the rural population, especially that of women, In _____ (1997).

As for the linkages, backward production linkages in Africa are generally limited because of the low inputs in agriculture. Forward production linkages depend largely on the commodity being produced and the type of processing. Expenditure linkages are critical for African rural development: they are the primary mechanism by which agricultural growth affects the non-farm sector. To foster the development and expansion of farm/non-farm linkages in Africa, there must be an emphasis on improving agricultural technology. Backward and forward production linkages require modern agricultural-production systems (Davis, et al.,B. Davis, Reardon, T., Stamoulis, K. and Winters, P., 2002).

The primary focus here will be the linkages in the production market[2], more specifically on the agro-industrial investments and their forward linkages as a key source of loan/credit to smallholders and also as the key for the first round of income effects, both of which can lead to significant rural development. This section is intended to delineate the referred types of linkages, and present evidence of their size in SSA[3] - through previous research that estimated growth multipliers. The ultimate objective is to link the issue of growth linkages to credit activity of agro-industries.

Backward Linkages

These linkages refer to demand for inputs derived from the new activity, i.e., new agricultural producers require inputs (from the non-farming activities[4]) to be able to produce, for example the new net demand for logs arising from establishment of a saw mill (Delgado, Hopkins and Kelly, 1998). Examples of non-farm activities that supply inputs to farming activities include blacksmithing, metalworking and repair and fertilizer production. The type and magnitude of these linkages depend on the prevalent agricultural technology, size of holdings, and type of crop and whether production is irrigated or rain fed (Haggblade, Hazell and Brown, 1988). Research in SSA has found the size of those linkages to be considerably smaller than what is found in Asia. Limited use of fertilizer, agricultural equipment and irrigation in SSA determines this low order of magnitude (Benfica, Tschirley and Sambo, 2002).

Forward Linkages

New productive activities that arise as a result of having a new intermediate product on the market are the forward linkages. For example, the increased output of boards from the saw mill

[2] See Davis, Reardon, Stamoulis and Winters (2002), Benfica, Tschirley and Sambo (2002), Delgado, Hopkins and Kelly (1998), and Haggblade, Hazell and Brown (1988) for a comprehensive definitions and integration on sub-Saharan reality.
[3] See Delgado, Hopkins and Kelly (1998), Haggblade, Hammer, and Hazell (1991) and Haggblade, Hazell, and Brown (1988) for a comprehensive and broader survey of growth linkages and multipliers for SSA.
[4] The non-farm sector is defined here to include all processed agricultural goods.

(or decreases in the price of boards) would stimulate the construction industry (Delgado, Hopkins and Kelly, 1998). These linkages are said to be about ten times more important than backward linkages in SSA (Haggblade, Hazell and Brown, 1988). Among forward linkages in SSA, links with food processing have been identified as the most important, followed by distribution of agricultural products. By focusing exclusively on micro and small scale rural enterprises, many of the studies undertaken in the region have hidden the role of larger scale processing activities that take place predominantly in rural areas or are at least linked to those areas (Benfica, Tschirley and Sambo, 2002).

Agricultural growth multipliers

Growth multipliers indicate the upper limits of the extra net income that could be in rural areas from new production of non-tradable goods and services stimulated by consumer and intermediate spending of new household income deriving from the tradable sectors. These increments to income could come from technological progress in the production of tradable items, improvement in export prices, and so forth. Although the concept of agricultural growth linkages goes back at least to the 1950s — drawing on Ricardo in the early 19th century and Keynes in the early 20th — quantitative estimation of multipliers incorporating consumption as well as production demand is relatively recent. Peter Hazell and Steven Haggblade have been key contributors in this regard. Much of the existing literature on modelling agricultural multipliers is reviewed by Haggblade, Hammer, and Hazell (1991) and Haggblade, Hazell, and Brown (1989) (Delgado, Hopkins and Kelly, 1998).

Hazell and Haggblade's (1990) estimates from the cross-sectional econometric analysis show that on average for the whole of India an increase in agricultural income of 100 rupees will generate an additional 64 rupees in rural non-agricultural income, a 6 rupees difference with Rangarajan's (1982) result. In Punjab and Haryana areas, an equivalent increase in agricultural income will generate an additional 93 rupees, and in Madhya Pradesh and Bihar areas, it will generate only an additional 46 rupees. Hazell, Ramasamy, and Rajagopalan (1991) estimated the change in value-added relative to an initial change in gross output generated by an income-increasing technological change in agriculture, for North Arcot, India, and found that an in crease in agricultural income of 1 rupee will generate an additional 0.87 rupee in non-agricultural income. This can be seen in the Table 1.

In SSA, still on Table 1, the agricultural growth multipliers estimated till date, range from 1.27 in Mauritania, 1.50 in Sierra Leone and Nigeria, 1.66 in Malawi, 1.96 in Niger, 2.48 in Senegal's Central Groundnut Basin, 2.57 in Zambia, 2.81 in Nigeria's Gusau to 2.88 in Burkina Faso, and

in Madagascar a small increment of value added in agriculture increases overall value added by as much as 2.0 to 2.7 times the initial shock (Dorosh and Haggblade, 1994). This shows that the spin-off effect on local activities from the spending of increased farm incomes are relatively high, enforcing this way the agro-industrialization of the rural areas in order to achieve rural development.

Table 1 Agricultural growth multipliers in Africa and Asia

Study	Location	Value of total income growth from $1.00 of direct growth in agricultural income
Rangarajan (1982)	India, all	1.70
Bell, Hazell, and Slade (1982)	Malaysia, Muda River region	1.83
Hazell (1984)	Malaysia, Muda River region	1.82
Hazell and Haggblade (1990)	India, all	1.64
	India, Punjab and Haryana	1.93
	India, Madhya Pradesh and Bihar	1.46
Hazell, Ramasamy and Rajagopalan (1991)	India, North Arcot and Tamil Nadu	1.83
Rogers (1986)	Mauritania	1.27
Delgado, Hopkins and Kelly (1998)	Niger	1.96
	Senegal, Central Groundnut Basin	2.48
	Zambia	2.57
	Burkina Faso	2.88
Haggblade, Hazell and Brown (1988)	Sierra Leone and Gusau, Nigeria	1.50
Dorosh and Haggblade (1994)	Madagascar	2.0 – 2.7
Simler (1994)	Malawi	1.66
Haggblade, Hazell and Brown (1987)		
Assuming millet, sorghum and maize are non-tradable	Nigeria, Gusau	2.81

Source: Benfica, Tschirley and Sambo (2002), Delgado, Hopkins and Kelly (1998), Dorosh and Haggblade (1994), Rogers (1986).

A.4. Agency theory and contract bargaining

Agency theory and contract bargaining

Several aspects of the New Institutional Economics, such as contract theory, agency relationships (principle agent problems, incomplete contracts), transaction costs and the boundaries of the firm have become key focus areas (Barry, Sonka and Lajili, 1992). This theoretical framework is useful in analyzing the relationships between the farmer (agent) and the agribusiness (the principal), where decisions about the extent of vertical coordination and related contract specifications can influence the financial position and performance of both parties.

The profitability of CF for the company will depend to a large extent on the company's bargaining power relative to the suppliers and its contract enforcement costs. This is equally true for the growers as well. The agency theory (PA game) best explains the determinants of bargaining power in this scenario. Here – the principal being the firm and the farmer being the agent – the firm defines the terms of the contract with an anticipation of how the agent will respond to the strategy it proposes. But the firm will not be able to observe with certainty – due to information asymmetry – whether the poor performance, e.g. low yield, is due to acts of nature, poor management or contract violation by the grower. Thus in the PA game, the firm maximises its profit subject to the constraints that the grower will accept the contract and that the farmer will abide by the terms of the contract (Key and Runsten, 1999).

The firm will also be constrained by the costs, both direct and indirect (transaction). Direct costs will be determined by the contract terms. The transaction costs include per-grower costs that are of a fixed amount regardless of the size of the grower. These include items such as the costs of screening applicants, negotiation of the contract terms, monitoring grower behaviour (i.e., ensuring that specified production practices are followed), and providing information (e.g., extension services). The firm will also incur transactions costs that are proportional to the level of production. The grower, on the other hand, his participation decision will be influenced by three issues: the relative risk premium of the activity, shadow values of the credit and shadow prices of the labour (Warning and Hoo, 2000).

The farmer, on the other hand, maximises his returns subject to the participation and incentive compatibility constraints. The principal must ensure that agent gets at least what other opportunities available provides in order to the farmer be willing to participate. Secondly, the principal can only provide some incentive package in order to influence the farmer to follow the best direction for him, but is not able to choose the agent's action directly (Macho-Stadler and Perez-Castrillo, 2001; Key and Runsten, 1999). Thus, if the agency theory (PA theory) holds, a major element in contract compliance is providing the smallholder with credible prospects, and desire, for contract renewal. In this regard, smallholders can be seen as collateralizing future income rather than assets to secure upfront transfers from contracts. The contract must be

sufficiently attractive to the smallholder so that the costs of default (related to exclusion in future seasons) exceed the benefits from default (such as being able to pocket forward payments). If a contract is only marginally attractive in terms of profit then default risk is higher. Because the company has a quasi-monopsony it only has to allow reservation utility for the farmers so as to keep them under the contract.

The grower will accept the contract if it offers him greater returns than any alternative available. Thus competing agro-processing companies operating in the region determines how the firm has to set profitable terms in the contract. If there is competition in the agro-processing industry the farmers' level of profit will be bid up, while the firm will be having less bargaining power. When farmers face competition from other potential suppliers, their bargaining power is reduced. But the farmers yield greater bargaining power when they negotiate contracts collectively. It is possible for both the farmers and firms' organisations to have market power, resulting in bargaining game with an indeterminate outcome (Key and Runsten, 1999). In that case the balance of bargaining power will lean on the specificity of their productive assets, that is, the degree to which an asset is specialised for a particular product or trade. The greater the asset specificity, the less is the bargaining power.

Given the failures in legal institutions in most developing countries, the costs associated with enforcing a contract would be quite high. With significant monopsony power, the firms are better positioned to enforce contract terms via threats of withholding future contracts. The farmers have little incentive to violate terms of the contract if they are planning to grow the crop for at least more than one season. This further weakens the bargaining ground of the farmers. Its effect will be low profitability of their operations than would be the case if there were competition on the market. The price of inputs can be pegged at exorbitantly high prices or their products fetch below the market prices. Given the contentious issue of quality standards and grading with some crops, the farmers stand to lose profitability even further where there are no clear, pre-arranged grading criteria (Key and Runsten, 1999).

Table 1 summarises the market imperfection conditions that would influence organisational strategies, particularly those that would favour smallholder growers and whether the presence of market failures or high transaction costs would tend to increase (+) or decrease (-) the likelihood of observing one of the coordination type. There are certain characteristics of farmers that firms can exploit, and use them to their benefit in CF. Market imperfections result in such characteristics as high shadow value of liquidity, high risk-aversion, and high levels of family labour relative to land endowment among the farmers. These are some of the characteristics that would make firms employ CF as their first best strategy, ahead of the SM or VI (Key and Runsten, 1999).

Table 1 Influence of market failures on processor organizational strategies and scale of contract farmers

Market imperfections and transaction costs	Organisational strategy *			Characteristic of Outgrower favoured under CF	Scale **
	SM	CF	VI		
Imperfect credit market resulting in high costs of credit to Outgrower – firm act as lender via resource providing contract	-	+	+-	High shadow value of liquidity	S
Imperfect insurance market and high crop price risk – firm acts as insurer via forward contract	-	+	+	Highly risk averse with poor ability o self insure	S
High labour supervision costs due to crop/technology requirements	+	+	-	High ratio of total labour being self-supervised	S
Missing markets for family labour and land (labour-intensive crops)	+	+	-	High levels of family labour relative to land endowment	S
One or few processors resulting in market power for processors (monopsony)	-	+	-	?	?
Organised farmers have market (bargaining) power (monopoly)	+	-	+	Unorganised growers	S
Growers have few alternative income/production opportunities - low bargaining costs for firm	-	+	-	Poor, with few productive assets	S
High contract enforcement costs (poorly functioning legal institutions)	+	-	+	Less likely to default on contract	?

Source: Adapted from Key and Runsten (1999)**.**

* Organisational strategy: SM – Spot Market; CF – Contract Farming; VI – Vertical Integration (Plantation). + favours the organisational strategy; - does not favour the organisational strategy.

** Scale: Scale of outgrower likely to be associated with the favoured characteristic under CF. S – favours small scale outgrowers; ? – ambiguous effect on scale

A.5. Farm Household decision making process

Farm Household decision making process

Agricultural households are the main form of economic organisation in developing countries with roughly 70 percent of the labour force in low-income countries employed in the agricultural sector (Singh, Squire and Strauss, 1986). Farm household, is defined, by Nakajima (1986), as an economic entity, which is a *complex of the farm firm, the labourer's household and the consumer's household* whose behavioural principle is utility maximisation. A farm firm due to the farm production activities utilising its own family labour, which in turn makes them labourer's household, in order to obtain income based on the maximization behaviour. Being a consumer's household, also based on maximization behaviour, its utility function, a pure consumer's, contains family labour (Mukorera, 2001).

In a household, the decision about production, consumption, and work are integrated into a single household problem which is under the households' decision makers' duty. Unlike a pure consumer, the household problem becomes utility maximisation subject to the production function, cash income and time constraint. The time constraint regards to the choice between work and home time, which excludes time that is spent directly in productive and labour market activities. The decision about the choice is on the level of household income, thus, production and work, which in turn influences consumption decisions. The only hinge between production and consumption decisions is the profit made in production. Since both the price of the agricultural produce and labour enter into both production and consumption decisions, the policy effect on each household will depend on whether the affected prices enter as a benefit or a cost to the household. The effect on household welfare of a price change will then depend on whether a household is a net seller or a net buyer of the product or factor affected by the price change (Mukorera, 2001).

According to Sadoulet and de Janvry (1995), if perfect markets exist for all products and factors, including the different categories of family labour, all prices are exogenous to the household and all products and factors are tradable with no transaction costs. In this case, the decision prices for the household are the market prices, which in turn determine the opportunity cost of all products and factors owned by the household. With the assumption of zero transaction costs a household behaves as if production and consumption/work decisions were made sequentially. First a household make decisions on production, and then decisions on consumption follow subject to the agricultural income and income from other sources. Thus a household model is considered separable under such conditions (Mukorera, 2001).

If there are market imperfections and the market is not used for a transaction, the household behaves as if markets existed within the household for the non-tradable product or factor the household own. The market equilibrium on this fictitious market determines a shadow price that

serves as the decision price for the household. Many households face different types of market failures and various levels of credit constraints. In such cases, the household's problem is maximising utility subject to constraints such as cash, credit, production technology, and exogenous effective market prices for the tradable, and equilibrium conditions for non-tradable. When there are market imperfections, production by a particular household becomes a function of household characteristics and the quantity of productive resources a household controls (Mukorera, 2001).

Gavian and Fafchamps (1996) concluded that yields were strongly influenced by manpower available to farm households in Niger which indicated that returns to land and labour were not equalised across households. Holden *et al*, (2001) found that there were significant market imperfections in labour and land markets in Ethiopia, and that these imperfections affected at the plot level land profitability. Heltberg (1998) found that market imperfections have efficiency implications on use of various productive resources owned by households and it has often been observed to influence significant inverse farm size-land productivity relationship (Mukorera, 2001).

A.6. Market Failures

Market Failures

The standard theories of efficiency of competitive markets are based on the premise that there economic agents have perfect information, or more precisely, that the information held by individuals or firms is not affected by what they observe in the market and cannot be altered by any action they can undertake, including acquiring more information (Stiglitz, 1994). It is known that even most competitive economies of the world suffer from insufficiency supply of information. When there is informational asymmetry coupled by very high transaction costs, the market fails. There are no clear and concise definitions of market imperfections and market failures, and there is no clear distinction between them. As a result the two are often used interchangeably.

A farm household is typically located in an environment characterised by a number of market failures for some of its products and factors. Because of the risk and asymmetrical information inherent in agriculture, formal financial institutions ration the amount of credit supplied to the small farm sector, giving rise to liquidity or credit constraints, according to Carter (1988). Formal lending institutions normally require collateral in form real assets as a precondition for offering loans. Most small farmers do not have titles to their small pieces of land (Mukorera, 2001). The resulting lack of liquidity, during planting and growing seasons limits the farmers to rent in labour and land, and to purchase inputs.

Related to the prices, market failure can occur when wide price margins between the selling and buying prices of a commodity or factor at the household level. The price margins can widen because of high transaction costs, shallow local markets and price risks or risk aversiveness of the farmer. Sadoulet and de Janvry (1995) poitout that transaction costs include distance from the market and poor infrastructure that increase transportation costs, high market margins due to merchants with a local monopsony power, high search and recruitment costs due to imperfect information, and supervision and incentive costs on hired labour. Thus exclusion of certain households from certain markets can happen (Mukorera, 2001).

A.7. Pricing arrangements in CF scheme

Pricing arrangements in C-F scheme

Price Formulas	Strengths	Weaknesses
Administered prices (government sets price for product and processor)	Producer and processor protected from market risk	Government or consumer carries the market risk. Benefits maynot be distributed equitably between producers and processors.
Contract growing (growers price fixed, residue taken by processor)	Producers protected from financial risk	Producers do not benefit from profits at times of high commodity prices. Processor may lose money at periods of low prices.
Contract processing (processors price fixed, residue taken by grower)	Processor protected from risk. Producer retains bulk of profit at period of high prices.	Producers bear total risk and may stop deliveries at periods of low prices. Processor has reduced incentive to maximize efficiency.
Revenue sharing (profit distributed in agreed proportion between producer and processor)	Market risk shared between producer and processor.Benefits shared between producer and processor giving each the incentive to improve efficiency.	-----
Free bargaining (open market system):	-----	-----
i) Flexible prices	Known price formula: the price calculation base (agreed processing and other costs, world market prices) is known by everyone.	Both producers and processors are subject to the world market price fluctuation.
ii) Calculated on spot market values	Producers can benefit from the high market prices.	Price formula unknown by producers. Disagreements on what constitutes the market price.
iii) On consignment basis	-----	Prices calculated after the produce is marketed and sold.
iv) Split pricing	Possibility of receiving twice for one seasons marketable produce.	Time spam between the 1st price (agreed base price) and the 2nd price (dependent on the market) might be long. Both producers and processors are subject to the world market price fluctuation.

Source: Adapted from Baumann (2000) and Eaton and shepherd (2001).

A.8. Characteristics of contract farming structures

Characteristics of contract farming structures

Structure - Model	Sponsor (Processor)	General Characteristics
Centralized	Private corporate sector State development agencies	Directed CF. Popular in many developing countries for highvalue crops. Commitment to provide material and management inputs to farmers.
Nucleus State	State development agencies Private/public plantations Private corporate sector	Directed CF. Recommended for tree crops, e.g. oil palm, where technical transfer through demonstration is required. Popular for resettlement schemes. Commitment to provide material and management inputs to farmers.
Multipartite	Sponsorship by various organizations, e.g. • State development agencies • State marketing authorities • Private corporate sector • Landowners • Farmer cooperatives	Common joint-venture approach. Unless excellent coordination between sponsors, internal management difficulties likely. Usually, contract commitment to provide material and management inputs to farmers.
Informal developer	Entrepreneurs Small companies Farmer cooperatives	Not usually directed farming. Common for short-term crops; i.e. fresh vegetables to wholesalers or supermarkets. Normally minimal processing and few inputs to farmers. Contracts on an informal registration or verbal basis. Transitory in nature.
Intermediary (tripartite)	Private corporate sector State development agencies	Sponsors are usually from the private sector. Sponsor control of material and technical inputs varies widely. At time sponsors are unaware of the practice when illegally carried out by large-scale farmers. Can have negative consequences.

Source: Adapted from Eaton and Shepherd (2001).

A.9. Lessons from experience with Contract Farming

Lessons from experience with Contract Farming1

The main lessons from the experience with contract farming emerging from the literature reveal a number of factors that determine the success of contract farming ventures. In general, it can be argued that the chances of success will be enhanced if the following measures are taken:

- The farmer partners should be properly screened.
- The country-specific historical and institutional legacies that have shaped local conditions should be taken into account in project design.
- Commodities requiring more labour-intensive production techniques should be selected. A crop that requires low levels of mechanization and high labour inputs may not be suited to large producers, who could have the same labour and supervision problems as plantations. The production of a commodity that is delicate, highly perishable, involves a high level of labour inputs and a low level of mechanization, and that needs a high degree of coordination, technology inputs and tight quality specificity is better suited to contract farming involving small farmers. (As discussed in Section 5, the danger still exists that agribusiness could prefer contract arrangements with large-scale farmers.)
- Crops displaying a high value per hectare, as well as requiring post-harvest facilities that are not feasible for the farmer, should be selected. Commodities with high transaction costs in marketing and processing and economies of scale higher in the marketing chain are the crops ideally suited for some form of vertical integration, such as contract farming.
- Mutual asset specificity between the contracting partners should be incorporated, thus raising the exit costs for both partners and ensuring a much more stable and sustainable relationship.
- The location and concentration of growers in relationship to the location of the agribusiness firm and other logistical factors should be optimized.
- If a competitive local market is present, contracted farmers may choose to sell to the fresh market instead of the contracting firm, who is often unable to legally enforce contractual obligations. Serious disruption to input supplies to farmers can result in such a situation.
- The legal system should be well-developed, strong and respected, ensuring contract enforcement at minimal costs.
- Contractual relations should be well managed and based on mutual trust. The perceived high levels of contract manipulation by agribusiness firms, distrust by farmers of the contractual relationship, and a perception of loss of autonomy have characterized contract farming in developing countries. Removing all elements of mistrust and establishing trustworthy relationships are important measures for success.
- Farmer interests should be well represented in contract negotiations. In this respect, the formation of farmer cooperatives in a contract farming arrangement is seen as the most cost-effective way to represent the interests of the contracted farmer, as well as for the integrator to deliver inputs and services to the individual farms.
- Agribusiness should play a key role in coordinating farmers' access to a range of inputs, services and facilities. These could include promoting literacy, improving business skills, fostering farmer links with agribusiness and banks, establishing a facility for resolving conflicts, infrastructure development.

[1] In Kirsten and Sartorius (2002), *Linking agribusiness and small-scale farmers in developing countries: Is there a new role for Contract Farming?*, page 9.

Appendix B

Empirical build up

Table B.1. Description of Variables Used in the Analysis

Variable	Type	Description
Dependent Variable – Household's Credit Source		
hh_creds	Dummy	1 = credit source as the Processing company; 0 = Otherwise
Credit risk indicators		
hh_farmr	Discrete	Farming activity risk proxy[1]
hh_def_a	Discrete	Proxy for default on credit[2]
hh_tiph	Discrete	Total Income per household[3]
Asstarea	Discrete	Ratio of assets over area[4]
Household's assets endowment, for farming, characteristics		
hh_ofn	Discrete	Owned number of fields
hh_ola	Discrete	Owned area in hectares
hh_ran	Discrete	Total number of hand tools assets
hh_tan	Discrete	Total number of capital assets
lnhh_size	Discrete	House hold size controlled for the number of childrens.
Household Head Educational characteristic's Dummies		
hhh_ilit	Dummy	1= Illiterate; 0 = Otherwise
hhh_ep1	Dummy	1 = Fist grid Primary school; 0 = Otherwise
hhh_ep2	Dummy	1 = Second grid Primary school; 0 = Otherwise
hhh_sec	Dummy	1 = Secondary school; 0 = Otherwise
Household Head Demographic characteristic's Dummies		
hh_head	Dummy	1= Male; 0 = Female
hhh_020	Dummy	1 = Less than 20 years; 0 = Otherwise
hhh_2040	Dummy	1 = Between 20 and 40 years; 0 = Otherwise
hhh_400	Dummy	1 = More than 40 years; 0 = Otherwise
Household's activities characteristics		
hh_ccpro	Discrete	Proportion of land for the cash crop farming
hh_fcpro	Discrete	Proportion of land for the food crop farming
hh_fb	Discrete	Working in the farming sector
hh_ob	Discrete	Working in other type of business
Tobacco related indicators		
tobsal_a	Discrete	Revenue from tobacco sale
credre_a	Discrete	Value of the Credit repaid
credva_a	Discrete	Value of the credit acquired
Agro industry (the CF contractor)		
empdum1	Dummy	1 = MLT; 0 = Otherwise
empdum2	Dummy	1 = DIMMON; 0 = Otherwise
Location dummy		
distdum1	Dummy	1 = Angónia; 0 = Otherwise
distdum2	Dummy	1 = Chifunde; 0 = Otherwise

[1] Derived by the following formula: $hh\_farmr = crops / fields$ at household level.

[2] Derived as follows: $hh\_def\_a = 1 - (credre\_a / tobsal\_a)$.

[3] Derived by the following formula: $hh\_tincph = totinc / hh\_size$.

[4] Derived as follows: $(hh\_tan + hh\_ran) / hh\_ola$.

distdum3	Dummy	1 = Macanga; 0 = Otherwise
distdum4	Dummy	1 = Marávia; 0 = Otherwise

*The farming activity is the only one which is not computed as net income, but sales revenue.
**Given by parents, Borrowed by friends or parents, and others.

Table B.2. Descriptive statistics of Variables Used in the Analysis

Variables	Sample	N	Mean	Std. Deviation	t-statistic[1]
hh_creds	All	406	0.441	0.497	-2.488
	Under CF	165	0.830	0.377	
	Outside CF	241	0.174	0.380	
hh_tiph	All	406	-581.683	25,069.830	-0.186
	Under CF	165	886.643	3,750.925	
	Outside CF	241	-1,586.969	32,380.187	
hh_farmr	All	406	4.510	3.095	2.634
	Under CF	165	1.943	1.016	
	Outside CF	241	6.267	2.799	
hh_def_a	All	393	-0.581	6.244	7.090
	Under CF	152	-2.137	9.861	
	Outside CF	241	0.401	0.000	
asstarea	All	252	2.798	1.776	1.566
	Under CF	165	3.189	1.855	
	Outside CF	87	2.056	1.340	
hh_ofn	All	406	2.443	1.356	-1.688
	Under CF	165	3.164	1.345	
	Outside CF	241	1.950	1.124	
hh_ola	All	406	4.205	5.247	-1.965
	Under CF	165	7.450	5.757	
	Outside CF	241	1.984	3.409	
hh_ran	All	405	11.933	12.762	-1.113
	Under CF	165	16.533	17.587	
	Outside CF	240	8.771	6.198	
hh_tan	All	406	3.722	5.066	-0.794
	Under CF	165	4.988	5.429	
	Outside CF	241	2.855	4.616	
lnhh_siz	All	406	1.617	0.490	-0.533
	Under CF	165	1.699	0.425	
	Outside CF	241	1.560	0.524	
hhh_ilit	All	406	0.377	0.485	0.920
	Under CF	165	0.236	0.426	
	Outside CF	241	0.473	0.500	
hhh_ep1	All	406	0.384	0.487	0.167
	Under CF	165	0.479	0.501	
	Outside CF	241	0.320	0.467	
hhh_ep2	All	406	0.091	0.288	-0.465
	Under CF	165	0.133	0.341	
	Outside CF	241	0.062	0.242	
hhh_sec	All	406	0.030	0.170	-0.809
	Under CF	165	0.073	0.260	
	Outside CF	241	0.000	0.000	
hh_head	All	406	0.823	0.382	-0.919
	Under CF	165	0.933	0.250	
	Outside CF	241	0.747	0.436	
hhh_020	All	406	0.025	0.155	0.132
	Under CF	165	0.018	0.134	
	Outside CF	241	0.029	0.168	
hhh_2040	All	406	0.498	0.501	-0.458

[1] The t-statistics refers to t-tests comparing the means of the two samples, and all are under $p<0.05$.

	Under CF	165	0.570	0.497	
	Outside CF	241	0.448	0.498	
	All	406	0.525	0.500	
hhh_400	Under CF	165	0.467	0.500	0.368
	Outside CF	241	0.564	0.497	
	All	406	0.208	0.220	
hh_ccpro	Under CF	165	0.312	0.214	-1.505
	Outside CF	240	0.137	0.195	
	All	406	0.230	0.311	
hh_fcpro	Under CF	165	0.567	0.218	-3.434
	Outside CF	241	0.000	0.000	
	All	406	0.569	0.587	
hh_ob	Under CF	165	0.570	0.700	-0.004
	Outside CF	241	0.568	0.496	
	All	406	0.544	0.499	
hh_fb	Under CF	165	0.939	0.239	-2.517
	Outside CF	241	0.274	0.447	
	All	406	9,304,000.00	9,143,189.54	
credva_a	Under CF	165	9,304,000.00	14,368,231.30	0.000
	Outside CF	241	9,304,000.00	0.000	
	All	406	10,227,302.65	12,252,547.92	
tobsal_a	Under CF	165	10,227,302.65	19,254,489.01	0.000
	Outside CF	241	10,227,302.65	0.000	
	All	406	6,170,602.50	7,197,907.68	
credre_a	Under CF	165	6,170,602.50	11,311,282.77	0.000
	Outside CF	241	6,170,602.50	0.000	
	All	406	0.224	0.418	
empdum1	Under CF	165	0.552	0.499	-2.491
	Outside CF	241	0.000	0.000	
	All	406	0.182	0.387	
empdum2	Under CF	165	0.448	0.499	-2.188
	Outside CF	241	0.000	0.000	
	All	406	0.446	0.498	
distdum1	Under CF	165	0.218	0.414	1.453
	Outside CF	241	0.602	0.491	
	All	406	0.182	0.387	
distdum2	Under CF	165	0.448	0.499	-2.188
	Outside CF	241	0.000	0.000	
	All	406	0.133	0.340	
distdum3	Under CF	165	0.224	0.418	-0.853
	Outside CF	241	0.071	0.257	
	All	406	0.239	0.427	
distdum4	Under CF	165	0.109	0.313	0.966
	Outside CF	241	0.328	0.470	

Table B.3. Odds ratio logistic regression results

Logit hh_creds odds ratio		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
hh_tiph	β	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
	P>|z|	0.149*	0.118*	0.022*	0.048*	0.065*	0.212*	0.064*	0.0484*
	e^{β}	2.71801	2.71801	2.71801	2.71801	2.71801	2.71801	2.71801	2.71801
hh_farmr	β	0.5709	0.6571	0.6505	0.7754	0.8019	0.8077	0.8034	0.9307
	P>|z|	0.000*	0.012*	0.006*	0.196*	0.241*	0.256*	0.247*	0.708*
	e^{β}	1.769859	1.92919	1.916499	2.171461	2.229773	2.242744	2.233121	2.536284
hh_def_a	β	0.9253	0.9043	0.9041	0.9059	0.9311	0.9310	0.9319	0.9624
	P>|z|	0.120*	0.067*	0.056*	0.098*	0.168*	0.126*	0.170*	0.466*
	e^{β}	2.522625	2.470202	2.469708	2.474158	2.537299	2.537045	2.539329	2.617972
asstarea	β	1.222	0.7994	0.7537	0.7397	0.7456	0.7558	0.7457	0.7432
	P>|z|	0.168*	0.087*	0.033*	0.029*	0.035*	0.039*	0.036*	0.071*
	e^{β}	3.393969	2.224206	2.124847	2.095307	2.107706	2.129314	2.107916	2.102653
hh_ofn	β	-	1.4732	1.4190	1.8819	1.7860	1.7465	1.7778	1.4216
	P>|z|	-	0.074*	0.127*	0.006*	0.009*	0.012*	0.010*	0.244*
	e^{β}	-	4.363175	4.132985	6.565968	5.965543	5.734497	5.916825	4.143745
hh_ola	β	-	0.8363	0.8058	0.8435	0.8801	0.8893	0.8800	0.8702
	P>|z|	-	0.665*	0.007*	0.062*	0.225*	0.252*	0.225*	0.137*
	e^{β}	-	2.307812	2.238487	2.324488	2.411141	2.433426	2.4109	2.387388
hh_ran	β	-	1.3147	1.3280	1.3230	1.3708	1.3611	1.3700	1.2978
	P>|z|	-	0.001*	0.001*	0.010*	0.003*	0.002*	0.004*	0.002*
	e^{β}	-	3.723634	3.773489	3.754669	3.9385	3.900481	3.935351	3.661233
hh_tan	β	-	1.0621	1.0573	0.9921	0.9933	0.9941	0.9923	0.9518
	P>|z|	-	0.165*	0.266*	0.899*	0.915*	0.924*	0.904*	0.541*
	e^{β}	-	2.892439	2.878588	2.696892	2.70013	2.702291	2.697431	2.590368
lnhh_siz	β	-	0.8599	0.9097	0.7948	0.6576	0.6427	0.6622	1.0273
	P>|z|	-	0.702*	0.907*	0.654*	0.495*	0.459*	0.507*	0.964*
	e^{β}	-	2.362924	2.483577	2.213998	1.930154	1.901608	1.939054	2.793513
hhh_ilit	β	-	-	0.4703	0.4149	0.5045	0.5019	0.5032	0.2120
	P>|z|	-	-	0.419*	0.431*	0.601*	0.589*	0.601*	0.225*
	e^{β}	-	-	1.600474	1.51421931	1.656157	1.651857	1.654006	1.236148
hhh_ep1	β	-	-	0.8425	1.2194	1.7057	1.2761	1.7238	0.4047
	P>|z|	-	-	0.841*	0.849*	0.669*	0.843*	0.666*	0.407*
	e^{β}	-	-	2.322165	3.38515603	5.505238	3.58264	5.60579	1.498853
hhh_ep2	β	-	-	0.2371	0.1968	0.1930	0.1363	0.1956	0.0240
	P>|z|	-	-	0.116*	0.132*	0.205*	0.130*	0.210*	0.014*
	e^{β}	-	-	1.267568	1.21750052	1.212883	1.146026	1.21604	1.02429
hhh_sec	β	-	-	0.7713	1.0270	1.3122	1.0206	1.3182	0.2251
	P>|z|	-	-	0.838*	0.985*	0.870*	0.989*	0.870*	0.316*
	e^{β}	-	-	2.162576	2.79267523	3.714336	2.774859	3.736689	1.252448
hh_head	β	-	-	3.1417	2.6999	2.7238	3.0265	2.7101	2.9644
	P>|z|	-	-	0.034*	0.075*	0.095*	0.075*	0.096*	0.177*
	e^{β}	-	-	23.14318	14.8782438	15.23812	20.62492	15.03078	19.38307
hhh_020	β	-	-	0.6662	0.2949	0.2638	0.4242	0.2589	0.7089
	P>|z|	-	-	0.580*	0.132*	0.155*	0.419*	0.154*	0.728*
	e^{β}	-	-	1.946825	1.34299205	1.301868	1.528367	1.295504	2.031755
hhh_2040	β	-	-	0.3003	0.1747	0.1034	0.1104	0.1043	0.1199
	P>|z|	-	-	0.221*	0.041*	0.028*	0.051*	0.027*	0.012*
	e^{β}	-	-	1.350264	1.1908889	1.108935	1.116725	1.109933	1.127384
hhh_400	β	-	-	0.3334	0.2339	0.1610	0.1548	0.1629	0.1630
	P>|z|	-	-	0.171*	0.092*	0.065*	0.087*	0.064*	0.026*
	e^{β}	-	-	1.395705	1.26351813	1.174685	1.167424	1.176919	1.177037
hh_ccpro	β	-	-	-	15,713.83	42,246.38	29,890.04	44,142.19	412,411.3

	P>|z|	-	-	-	0.000*	0.000*	0.000*	0.000*	0.000*
	e^{β}	-	-	-		(too large to be computed)			
	β	-	-	-	17.2201	19.9165	8.0616	19.5965	0.4552
hh_fcpro	P>|z|	-	-	-	0.008*	0.006*	0.075*	0.006*	0.723*
	e^{β}	-	-	-	30101935	446299139	3170.359	3.24E+08	1.576489
	β	-	-	-	1.3584	1.6781	1.5062	1.6942	1.7749
hh_ob	P>|z|	-	-	-	0.316*	0.130*	0.240*	0.130*	0.165*
	e^{β}	-	-	-	3.889964	5.35537109	4.509562	5.44229	5.899691
	β	-	-	-	2.1953	2.1854	1.9253	2.1754	0.8159
hh_fb	P>|z|	-	-	-	0.201*	0.227*	0.324*	0.226*	0.770*
	e^{β}	-	-	-	8.982695	8.89420552	6.857206	8.805707	2.26121
	β	-	-	-	-	0.9999	0.9999	0.9999	0.9999
credva_a	P>|z|	-	-	-	-	0.002*	0.002*	0.002*	0.000*
	e^{β}	-	-	-	-	2.71801	2.71801	2.71801	2.71801
	β	-	-	-	-	1.0000	1.0000	1.0000	1.0000
tobsal_a	P>|z|	-	-	-	-	0.233*	0.474*	0.221*	0.960*
	e^{β}	-	-	-	-	2.718282	2.718282	2.718282	2.718282
	β	-	-	-	-	0.9999	0.9999	0.9999	1.000
credre_a	P>|z|	-	-	-	-	0.083*	0.053*	0.098*	0.811*
	e^{β}	-	-	-	-	2.71801	2.71801	2.71801	2.718282
	β	-	-	-	-	-	3.6206	-	234.4864
empdum1	P>|z|	-	-	-	-	-	0.011*	-	0.007*
	e^{β}	-	-	-	-	-	37.35998	-	6.9E+101
	β	-	-	-	-	-	-	1.0962	-
empdum2	P>|z|	-	-	-	-	-	-	0.876*	-
	e^{β}	-	-	-	-	-	-	2.992772	-
	β	-	-	-	-	-	-	-	0.0067
distdum1	P>|z|	-	-	-	-	-	-	-	0.008*
	e^{β}	-	-	-	-	-	-	-	1.006722
	β	-	-	-	-	-	-	-	0.0748
distdum3	P>|z|	-	-	-	-	-	-	-	0.201*
	e^{β}	-	-	-	-	-	-	-	1.077669
	β	-	-	-	-	-	-	-	0.0058
distdum4	P>|z|	-	-	-	-	-	-	-	0.018*
	e^{β}	-	-	-	-	-	-	-	1.005817
Number of obs		239	239	239	239	239	239	239	239
Prob > chi2		0.0001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2		0.2869	0.4232	0.4590	0.5683	0.5978	0.6062	0.5979	0.6661
P > |t|		0.000*·**	0.000*·**	0.000*·**	0.000*·**	0.000*·**	0.000*·**	0.000*·**	0.000*·**

*At 95 % significance; ** At 99% significance.

Table B.4. Linear regression results

Reg hh_tiph	(1)	(2)
hh_creds	-1,085.8160	-1093.5310
P>|t|	0.248*	0,243*
hh_farmr	-51.0811	-60.2888
P>|t|	0.339*	0.255*
asstarea	-135.0103	-127.3049
P>|t|	0.405*	0.426*
hh_ofn	-107.3152	-100.9098
P>|t|	0.495*	0.514*
hh_ola	-97.1331	-95.1259
P>|t|	0.218*	0.224*
hh_ran	39.4660	38.9564
P>|t|	0.225*	0.231*
hh_tan	34.3388	33.6901
P>|t|	0.646*	0.655*
lnhh_siz	-764.7078	-777.5770
P>|t|	0.010*	0.009*
hhh_ilit	48.5695	52.2473
P>|t|	0.922*	0.916*
hhh_ep1	826.5695	817.6441
P>|t|	0.127*	0.131*
hhh_ep2	345.9105	342.2291
P>|t|	0.632*	0.636*
hhh_sec	1538.2640	1546.6740
P>|t|	0.309*	0.303*
hh_head	140.6980	174.9096
P>|t|	0.593*	0.504*
hhh_020	-18.0369	10.9133
P>|t|	0.984*	0.990*
hhh_2040	1556.8470	1556.8140
P>|t|	0.184*	0.184*
hhh_400	1586.7300	1574.485
P>|t|	0.212*	0.217*
hh_ccpro	922.0289	874.1382
P>|t|	0.269*	0.305*
hh_fcpro	967.9120	912.1123
P>|t|	0.441*	0.462*
hh_ob	649.3870	655.4203
P>|t|	0.010*	0.010*
hh_fb	505.5577	510.0466
P>|t|	0.040*	0.041*
distdum1	-887.6316	-
(P>|t|)	0.215*	-
distdum2	-	950.9512
P>|t|	-	0.190*
distdum3	-932.2982	-
P>|t|	0.218*	-
distdum4	-1174.3530	-

P>|t|	0.136*	-
_cons	437.9461	-504.8762
P>|t|	0.826*	0.750*
Number of obs	252	252
Prob > F	0.1507	0.1813
R – Squared	0.1236	0.1226

*At 95 % significance.